Flight Schedule Monitor User's Guide

Version 7.8

Prepared for Federal Aviation Administration
Traffic Management Applications
by
Metron Aviation, Inc.

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1. FSM Overview

Introduction

The amount of traffic in our National Airspace System (NAS) is expected to grow at least 3-5% for the next 15 years. The NAS is a static resource and a balance between the increase in traffic and available resources in the NAS must be found. The Federal Aviation Administration (FAA) responded to this issue by developing Free Flight. Free Flight is an innovative concept designed to enhance NAS safety and efficiency by transitioning from a centralized command and control system to a distributed planning system.

Collaborative Decision Making (CDM) is one of the five core products in Free Flight Phase I. CDM is a joint government/industry initiative aimed at improving air traffic management through increased information exchange, common situational awareness, equitable resource allocation, and performance analysis.

Flight Schedule Monitor (FSM) is being used in CDM's first major thrust, Ground Delay Program Enhancements, which went into Prototype Operations in January 1998. FSM fulfills the CDM goal of giving all users *common situational awareness*. Using real-time data culled from CDM participant data and aggregated by Volpe National Transportation Systems Center, FSM displays a current picture of air traffic demand at airports. Using this picture, air traffic specialists and airline operations centers alike make better decisions and keep traffic flowing as smoothly as possible.

When adverse conditions affect an airport, traffic flow is also affected. The airport is unable to handle a normal amount of arriving and/or departing aircraft and operations are disturbed. One method the FAA uses to compensate for reduced capacity at an airport is to delay flights arriving at that airport before these flights take off. This is known as a *Ground Delay Program*. As part of CDM Prototype Operations, all FAA traffic management personnel use FSM to determine the necessity of and impose ground delay programs and other traffic management initiatives.

FSM has been continuously enhanced since the early prototype capability to include better functionality and support for the ever-expanding user community. FSM was previously designed with C++ programming language, in order to keep up with increasing technology FSM has been completely rebuilt on the Java platform to better serve the CDM community. The Java FSM architecture is designed to support a large number of concurrent users at a single site. Java FSM is also designed to greatly improve threading options and enhance file handling, as well as other features including the built-in cross-platform UI support.

Today, traffic management specialists across the NAS and Canada, as well as over 40 CDM-participant airline users utilize FSM to monitor and manage airport demand and capacity.

The FAA Air Traffic Control System Command Center (ATCSCC) uses FSM to:

- Monitor airports - view the existing demand and constraints at these airports

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- Model and run traffic management initiatives, including, airborne holding, Ground Delay Programs (GDP), and Ground Stops (GS).
- Update EDCTs through the use of ECR

FSM is also used on a daily basis by Traffic Management Units in more than 80 FAA air traffic control (ATC) field facilities to monitor capacity and demand at over 50 airports.

Airline operations centers (AOCs) use FSM to:

- Monitor airports by viewing existing demand and constraints at these airports
- Analyze the impact of proposed Ground Delay Programs on their operations
- Model flight cancellations
- Send SCS requests to the hub site through the ECR component.

Purpose and Scope

FSM has two major purposes:

1. Monitoring Airport Capacity/Demand Data
2. Managing Traffic Flow

FSM monitors flights arriving at and departing from an airport while tracking demand and capacity. When an imbalance exists, traffic management specialists analyze different combinations of ground delay programs, airborne holding, etc. to determine the best way to fix the imbalance. Once a traffic management initiative (TMI) is determined, FSM will send out the parameters to the users and update its own data accordingly. Airline operations users model the effects of the TMI and decide whether to alter their own operations.

FSM displays both Monitored Live (Online) and Historical CDM data. Live data is used to monitor the current situation at any airport. In Live Data Mode, demand in the flight schedule display is updated approximately every 5 minutes to keep the picture current. Historical data can be used to replay a day's events and analyze the effects of any/all traffic management programs.

Limitations and Contacts

This document describes FSM as of 4/14/2004. Because FSM is an evolving product, future enhancements (i.e.- modifications and additional functions) will be introduced into this guide as they become available.

For information and/or technical assistance with FSM software, contact the following:

Government Personnel	Airline Personnel
ETMS Hotline (703) 904-3343	FSM Support (703) 234-0769 fsm_support@metronaviation.com

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Conventions

Conventions are the same throughout all FSM components unless otherwise specified.

Keyboard and Mouse Conventions

Command	What It Means
File > Open	Choose the Open option from the File menu.
Click	Click once with the left mouse button
Ctrl + click	Press Ctrl while clicking with the left mouse button
Double-Click	Click twice with the left mouse button
Ctrl 1	Press and release Ctrl; then press and release the number "1" on the keyboard.
Checkmark	Select the option with the left mouse button to make a checkmark appear in a checkbox.
CTRL + A	Press Ctrl while pressing A on your keyboard. Displays arrival data in the active component
CTRL + C	Press Ctrl while pressing C on your keyboard. Command used to close window or component.
CTRL + D	Press Ctrl while pressing D on your keyboard. Displays departure data in the active component.
CTRL + F	Press Ctrl while pressing F on your keyboard. Finds a particular flight by entering the flight's call sign and origin airport.
CTRL + L	Press Ctrl while pressing L on your keyboard. Displays a color legend for the active component.
CTRL + P	Press Ctrl while pressing P on your keyboard. Prints the active component on your screen.
CTRL + R	Press Ctrl while pressing R on your keyboard. Displays the Rename Window dialog box and allows you to change the title bar name of the active component on your screen.
CTRL + S	Press Ctrl while pressing S on your keyboard. Command used to save data.
CTRL + S	Press Ctrl while pressing S on your keyboard when in Historical Mode only, allows you to designate which time to view within a set of historical data.
ALT + F4	Press Alt while pressing F4 on your keyboard. Shuts down the component that you are viewing.
F1	Press F1 on your keyboard to access the web based on-line help for the active component.

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Note: All keyboard functions work the same in all components unless stated otherwise. If a particular keyboard command is used on a component where that option is not available, there will be no changes made to the component. Make sure the component is "active" you wish to submit when executing a command.

Common Terms Used in This Document

Component, Window, and Panel – The three terms are used interchangeably throughout this document. It refers to the window in focus on your screen.

Active - The term *active* is used two different ways. First, if several windows are open, only one window will be able to accept user input from either the mouse or keyboard - that window is *active*. Second, within the *active* window, only one action button, push button, or text entry field will be *active*.

Dialog box - A window that allows the user to enter text and/or use buttons to make choices.

Checkbox – A picture of a square box (checked or not checked) is drawn on the screen. When the user clicks the Checkbox, a checkmark will appear in the box and the item associated to that checkbox is selected. Several checkboxes can be selected at any one time.

Radio button - A picture of an analog push button (a circle with or without a "dot") is drawn on the screen. When the user clicks a radio button, a dot fills in the circle. Exactly one radio button in a group of radio buttons can be selected at any time.

Aggregate Demand List (ADL) - When Volpe National Transportation Systems Center receives updated flight schedules and other NAS information from participating CDM AOCs, the information is sent back to the users in the form of an "Aggregate Demand List" (ADL). The ADLs, which are updated approximately every 5 minutes, is used by FSM to process data and display the information. The ADL consists of 53 data fields, each of which is described in detail.

Airport Arrival Rate (AAR) - The number of arriving aircraft that an airport can accommodate during a certain period of time.

Airport Departure Rate (ADR) - The number of departing aircraft that an airport can accommodate during a certain period of time.

CDM - One of 5 core products in Free Flight Phase I, Collaborative Decision Making is a joint government/industry initiative whose goal is to improve air traffic management through increased information sharing, common situational awareness and equitable resource allocation.

Delay - The generic term "Delay" appears frequently throughout this manual. Delay is defined as ETA - (IGTA - taxi). IGTA is the initial gate time of arrival, and taxi (unless otherwise specified by the user in GDT Mode) has a default value of 10 minutes.

Ground Delay Operations - Any one of a number of ways to delay flights on the ground. This includes Ground Delay Programs, Ground Stops and Airborne holding.

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Ground Delay Program (GDP) - A specific Ground Delay Operation, which assigns delay (control times) to flights before departure.

Ground Stop (GS) - A specific Ground Delay Operation, which grounds/holds flights for a specified amount of time at their departure airports.

EDCT Change Request (ECR) – The EDCT Change Request tool is used to view and update an arriving flight's control times during a GDP.

Slot Credit Substitution (SCS) - A situation that commonly occurs during Ground Delay Programs (GDPs) where an operator has a flight f0 with a slot at time t0, and flight f0 cannot use its slot because it is delayed or cancelled. In these situations, Slot Credit Substitution (SCS) provides a mechanism for an operator to substitute other operator's flight(s) to bridge the slot from an unusable time to a time it can be used to the operator's advantage. SCS is an enhancement to the simplified substitution process implemented in ETMS 7.2.

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2 FSM Features

Introduction

This section provides a brief overview of the three FSM data modes: Monitored Live, Historical, and Ground Delay Tools (GDT) Mode. Monitored Mode (live) is used to monitor and display airport capacity and demand. Historical Mode allows the user to review past airport events through archived data and is an excellent means to conduct post analysis. Ground Delay Tools Mode is used for modeling and issuing Traffic Management Initiatives (TMIs), such as Ground Delay Programs and Ground Stops. The data mode you are currently viewing is listed after the ADL time in the title bar of each component (see Figure 2-1).

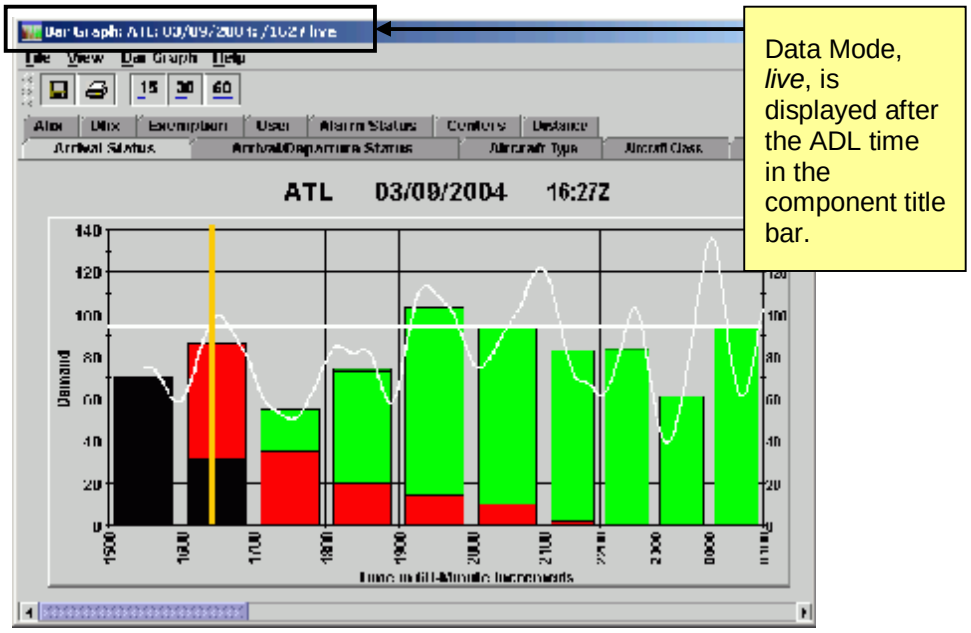

Figure 2-1: FSM Bar Graph Component

For more detailed information on individual components, see Chapters 3 and 4.

Main Data Modes

Monitored Live Mode Overview

In Monitor Mode, you can monitor airport capacity and demand information for both flight arrivals and departures in various FSM components. Demand data is updated approximately every 5 minutes in *live* mode, with every new ADL. FSM provides information that supports detailed flight data and various types of demand count lists. Alarms are generated if a flight violates pre-defined parameters.

When opening components from the Open Data Set, the two default Monitor Live Mode components are:

1. *Bar Graph* component - Displays demand versus capacity of a specified airport.
2. *Time Line* component - Displays how flights are distributed throughout each hour.

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These two components will open by default if the **Open With** options are not changed in the *Open Data Set* component. The *Time Line* and *Bar Graph* components can also be opened from the *Status Map* component. The *Flight List* component can be accessed using the *Open Data Set* as well, but is not selected by default. See Chapter 5 for more information on how to open FSM.

Additional components available in Live data mode are:

3. *Open Data Set* component – Allows for you to open airports in both Live and Historical data modes.
4. *Status Map* component – Displays what airports currently have a proposed, current, or recently cancelled TMI. The *Time Line, Bar Graph,* and *Flight List* components can also be opened individually from the *Status Map* component.
5. *Query Manager* component – Used to query an airport for user specified criteria.
6. *Flight List* component (can also be opened from the *Status Map* component) – Displays the flight list for the selected airport.

Figure 2-2 shows a possible monitor mode windows management. The *Open Data Set* component was used to select ATL. The two default components, *Time Line* and *Bar Graph*, are automatically displayed when no other components are selected in the **Open With** selection box of the *Open Data Set* component.

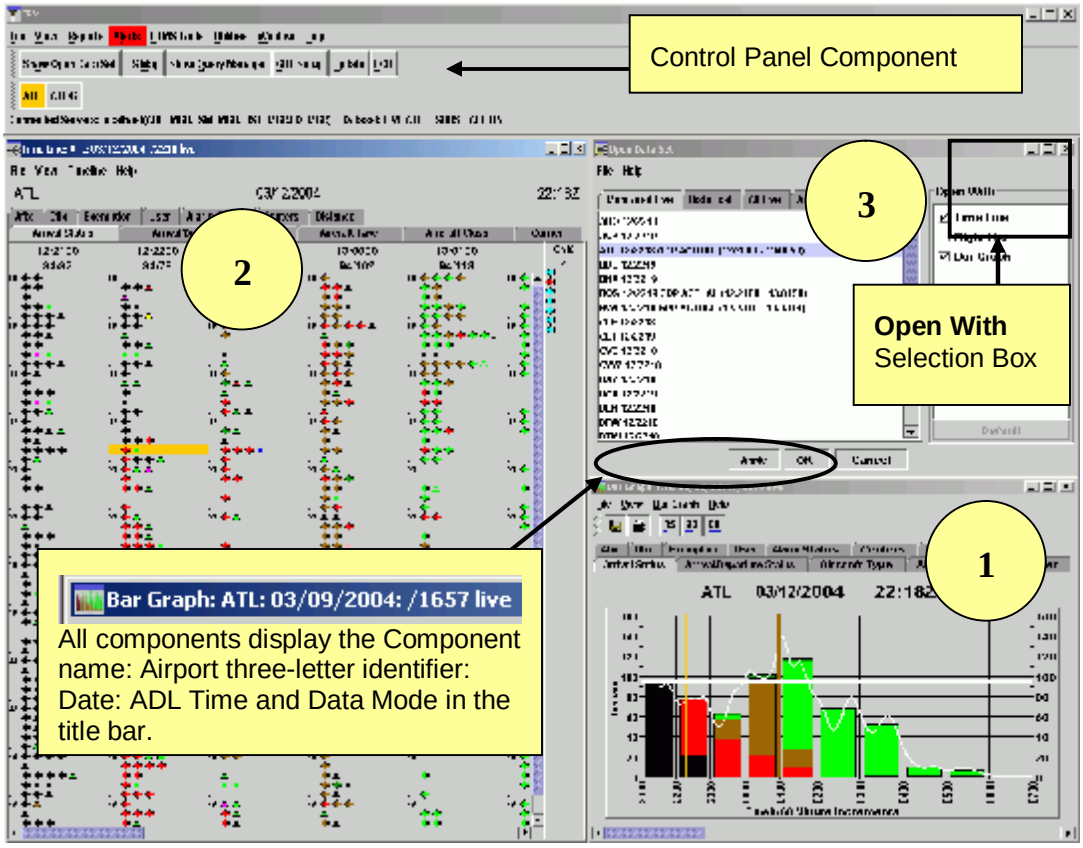

Figure 2-2: Monitor (Live) Mode

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Historical Mode Overview

Historical Mode allows the user to choose any data set that has been stored in a database. This data is available for recall to analyze scenarios or replay the day's air traffic events. From the *Open Data Set* component with the Historical tab active, the user can drill down to find the year, month, date, and airport of the desired information they wish to view. Once the date and airport are selected, FSM gives you the option of selecting a data time. See *Open Data Set* component in Chapter 3 for more information. Historical Mode data is displayed in much the same way as the Monitor Live Mode, however, ***historical*** will be listed next to the ADL time stamp in each Historical Mode component. In Historical Data Mode, data can be viewed in the same 5-minute ADL increments in which it originally arrived. Click the **Update** button on the *Control Panel* component to update the data to the next historical ADL time. (See Figure 2-3).

Historical Mode data must be opened using the *Open Data Set* component. The two default Historical Mode windows are:

1. *Bar Graph* component - Displays demand versus capacity of a specified airport.
2. *Time Line* component - Displays how flights are distributed throughout each hour.

These two components open by default if the **Open With** options are not changed in the *Open Data Set* component. You can access the *Flight List* component using the *Open Data Set* as well, but is not selected by default.

Additional components available in Historical data mode are:

3. *Open Data Set* component - Allows you to open airports in both Live and Historical data modes.
4. *Flight List* component - Displays the flight list for the selected airport.
5. *US Map* component – Displays what airports currently have a proposed, current, or recently cancelled TMI. The *Time Line, Bar Graph,* and *Flight List* components can also be opened individually from the *US Map* component. Historical data cannot be opened from the *US Map* component.

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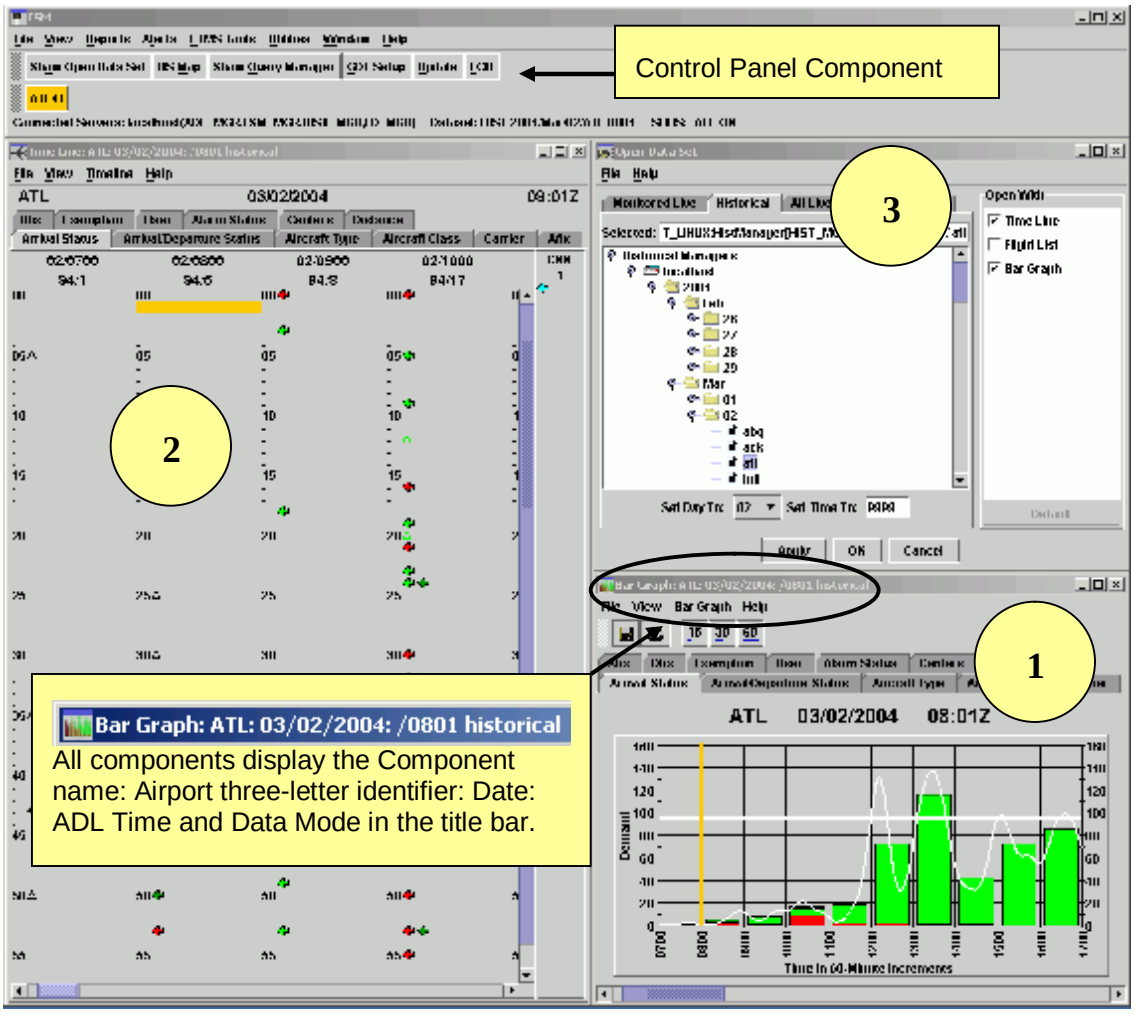

Figure 2-3: Historical Mode

Ground Delay Tools Overview

Although Monitor Live mode is primarily used to monitor airport demand/capacity balance and flight information, Ground Delay Tools (GDT) mode is used to help make air traffic management decisions and conduct analysis. A data set, or airport, must first be selected in either Monitor Live Mode (*live*) or Historical Mode (*historical*) to access GDT Mode. Once a data set is selected, click on the **GDT Setup** Button on main *Control Panel* component to open the airport in GDT mode. Four default components initially display when opening GDT Mode. For detailed information on the GDT components, see chapter 4.

> **Note**: GDT mode displays flight arrival information since Ground Delay Programs only affect flights arriving at the monitored airport. Departure information is not available in GDT mode components.

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The Ground Delay Tool components look similar to Monitor Live Mode (*live*), with the exception of the *GDT Setup* and *GDT Data Graph* component. The four default components that are displayed when GDT mode is opened (see Figure 2-4):

1. *GDT Setup* component – The main TMI setup panel, where you input the parameters.
2. *Data Graph* component – Graphically displays Power Run Statistics for modeled TMIs.
3. *GDT Map* component - Displays the Tier/Distance scope as well as individual centers and airports for a modeled TMI.
4. *Bar Graph* component – Displays demand versus capacity into the airport selected.

Additional components available in GDT data mode:

5. *GDT Data Table* component – displays the same data viewed in the Data Graph in tabular format.
6. *Flight List* component – Displays the flight list of the selected airports.
7. *GDT Time Line* component – Displays how flights are distributed throughout each hour.

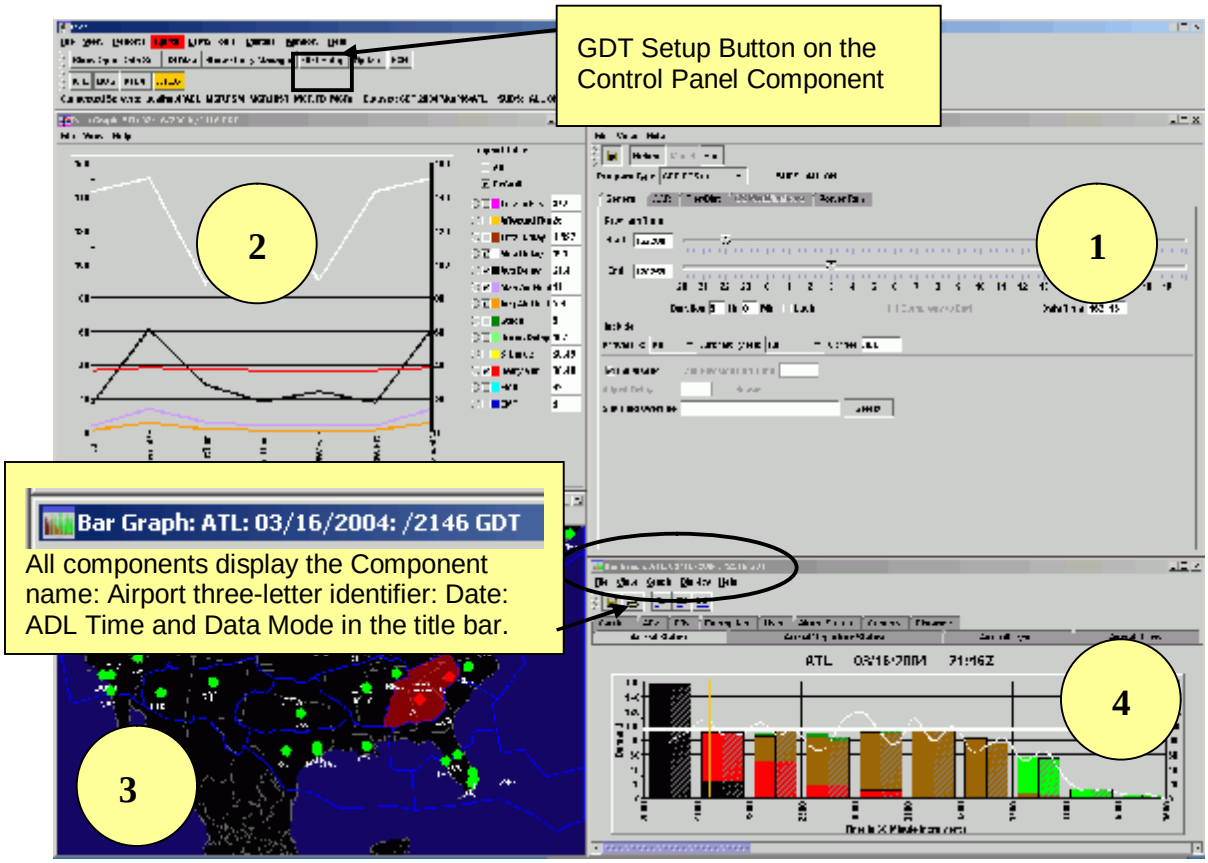

Figure 2-4: GDT Mode

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Java FSM Software Technical and Visual Issues

Technical Issues

As mentioned in Chapter 1, FSM was initially designed with C++ programming language, but to keep up with increasing technology; FSM has been completely rebuilt in Java to better server the CDM community. There are some differences from the user's perspective that should be noted when using Java based FSM. Most programming languages, such as C++, compile source code directly into machine code, which is executed in a particular microprocessor architecture. Instead, Java is run in a Java Virtual Machine (JVM) and is interpreted, not compiled. What this means to you is that commands will tend to take a few more seconds to execute. For example, if you press the **Show Data Set** button on the *Control Panel*, the *Show Data Set* component may take a second longer to appear on your screen. The main advantage of the new Java architecture is that it supports a wide range of platforms, thus giving Java FSM the same look and feel on various platforms.

Java software needs a Java Runtime Environment (JRE) on your computer to execute. FSM Version 7.6 requires a JRE version 1.3.1 or higher. Without an available JRE for a given environment, it is impossible to run Java software. For more Technical information, please see the FSM 7.6+ Technical Guide.

Visual Issues

Drop-down menu boxes do not automatically collapse when the mouse is moved away from the drop-down box. Expanded menu boxes remain open until the user clicks somewhere else on the screen (not in the box). Secondary pop-up boxes, as shown in Figure 2-5, act slightly different. You must move the cursor directly to the left or right, then up or down to select an option from the secondary pop-up menu. If you try to cut across diagonally, the pop-up menu will collapse.

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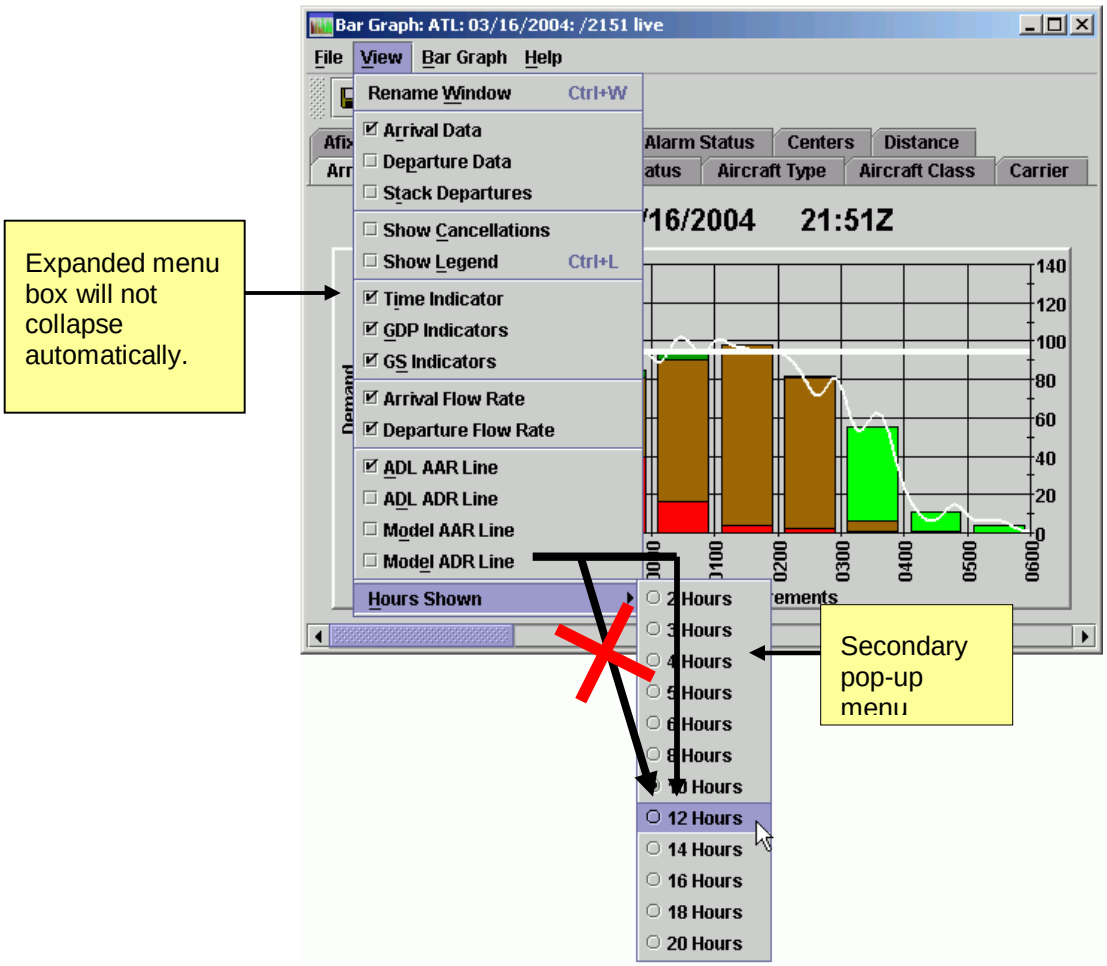

Figure 2-5: Java Navigation

Windows Conventions

This section provides an overview of the FSM user interface. It describes the windows, the menu bars, toolbars, and other important features. Figure 2-6 shows the FSM main *Control Panel* component. This panel is displayed for all FSM modes.

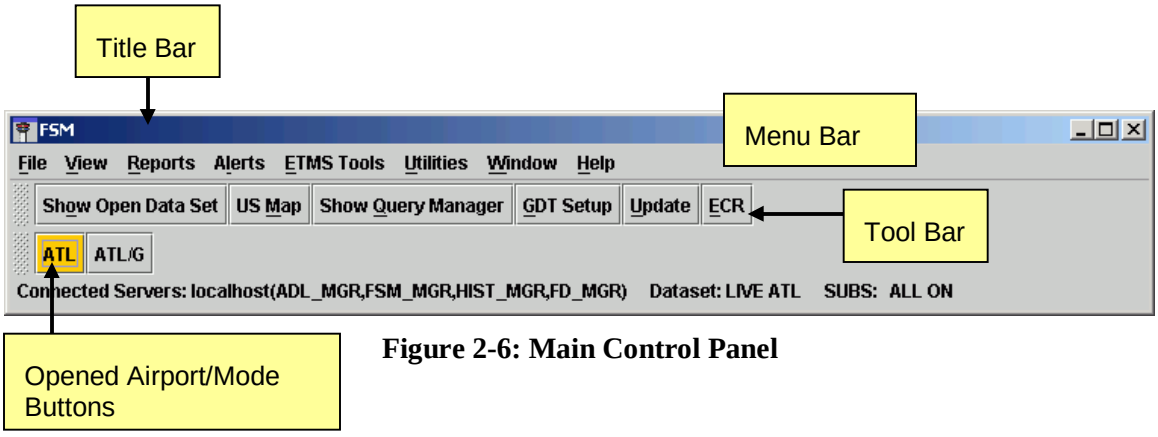

Figure 2-6: Main Control Panel

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Title Bar

The Title bar contains a control icon, window title, and Windows buttons.

Figure 2-7: Title Bar

The control icon is located on the left side of the title bar. Click it to open the Control menu, which contains commands for positioning, resizing, minimizing, maximizing and closing the window. Double clicking on the control icon will close the window.

The window title describes the contents of the window. In the Title display you will see the window name, airport three-letter identifier, date, ADL time and the data mode. Double clicking the window title area is the same as clicking the Windows Maximize or Restore buttons.

The Windows buttons located on the right side of the title bar are used to resize and close the window.

Table 2-1: Window Buttons

Minimize		Reduces the window to its windows icon on the taskbar
Maximize		Enlarges the window to fill the screen
Restore		Returns the window to its last size and position.
Close		Closes the window.

Menu Bar

The Menu bar, positioned directly below the title bar, displays the menu headings.

Figure 2-8: Menu Bar

The menus that are available depend on the window. Click a menu heading to open the menu and choose a command. The arrows next to a command indicate another submenu for that command. Open the submenu by placing the mouse cursor over the menu command (see Figure 2-9).

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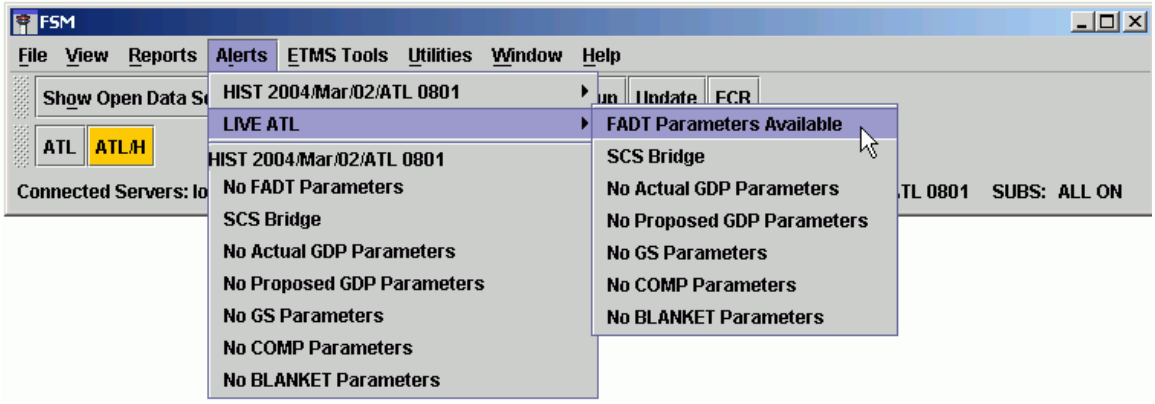

Figure 2-9: Submenu Structure

Toolbar

The docked toolbar is located directly under the menu bar.

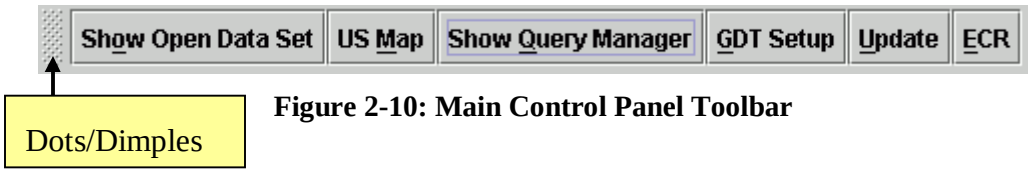

Figure 2-10: Main Control Panel Toolbar

The toolbar contains shortcut buttons for frequently used commands. The Commands that are available depend on the window. By default, the Toolbar is docked at the top of the window. You can undock it and move it to any location on your screen. Move the toolbar to your desired location by left-clicking and dragging the gray dots next to the save shortcut button. When the Toolbar is moved, the window title will display **Core**. Close the undocked window to re-dock the Toolbar to its original window.

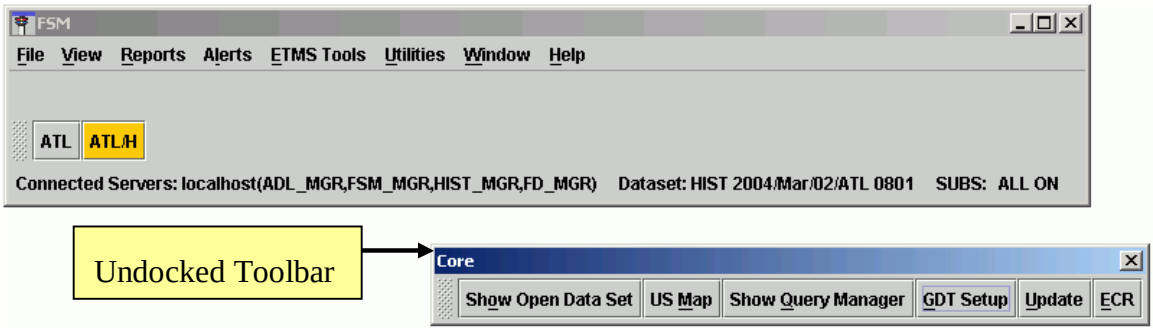

Figure 2-11: Moved Toolbar

Tabs

Tabs are found on most FSM components. Selecting a tab brings that tab option to the front of the component window. The Tab that is in focus will be highlighted. Tab options in the Bar Graph and Time Line are coloring options. When a tab is selected, the coloring option will be displayed in the component. For example, Figure 2-12 shows the Bar Graph with the coloring Tab Arrival Status selected. The time increment buttons are

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a new feature on the components window and are represented by 15, 30, and 60 minute buttons with a blue line underneath each.

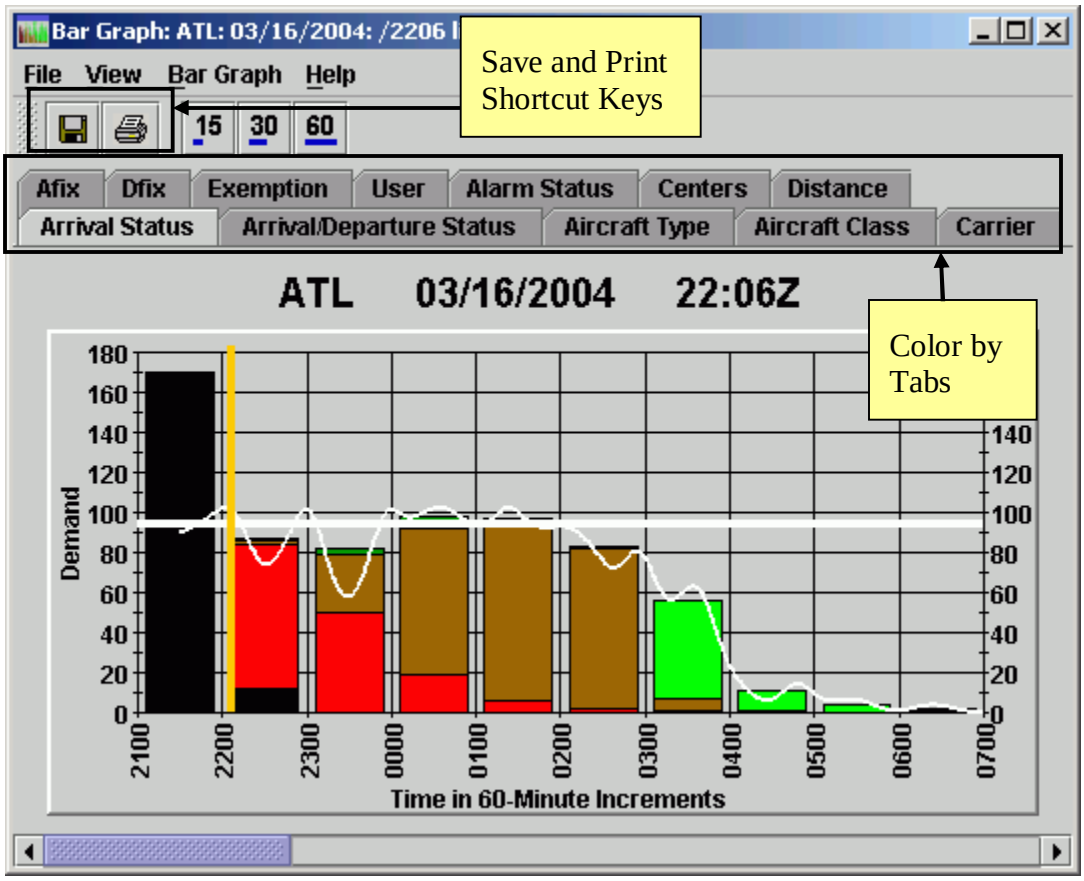

Figure 2-12: Component Tabs

Windows position and resizing

When more than one window is displayed, a window must be *active* to use it. Activate the window by clicking anywhere on it with your mouse. The title bar of an active window will be blue, while the title bar of an inactive window will be gray. In Figure 2-11 the main Control Panel is *not active* and the Core Toolbar is *active*.

Resizing windows allows you to view more windows on your screen at one time. To resize a window, position the mouse on any of the borders of the window until your mouse cursor changes to a double-sided arrow. When this appears, click and drag in the direction of your choice. When placing your cursor over a corner, the double-sided arrow is diagonal. This allows you to move 2 sides at the same time.

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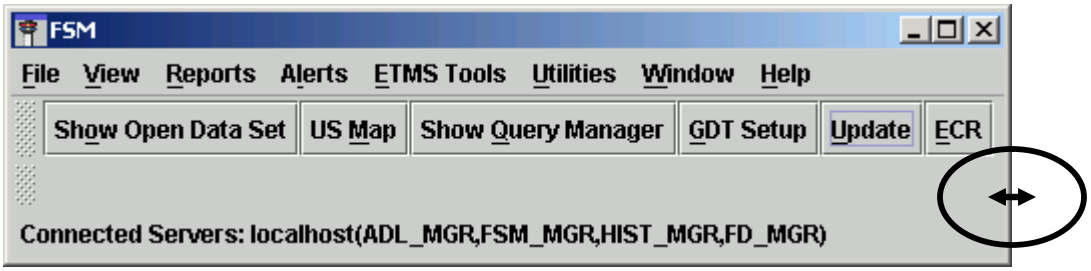

Figure 2-13: Windows Resizing

Moving a window

The windows in FSM can be moved around to suit the needs of the user. Left-click and drag the title bar of the window to move it to a desired position on the screen.

> **Note:** The cursor will remain as the normal mouse cursor and not a double-edged arrow.

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3 Monitor Mode Components

Monitor Mode components are used to monitor airport capacity and demand information for both flight arrivals and departures. Demand data updates approximately every 5 minutes in *live* mode, with every new ADL. This chapter familiarizes you with the main Monitor Mode components:

1. Control Panel
2. Open Data Set
3. US Map
4. Query Manager
5. Bar Graph
6. Time Line

Control Panel Component

The first component you will see upon opening FSM is the FSM *Control Panel*. The *Control Panel* component allows you to access all other FSM components for displaying, monitoring, and managing traffic flow at any airport. The *Control Panel* consists of the menu bar and six buttons, each of these options are outlined below. When an airport is opened, an associated button will be displayed just above the Connected Servers information. The purple text, displayed beneath the *Control Panel* buttons, identifies what server you are connected to.

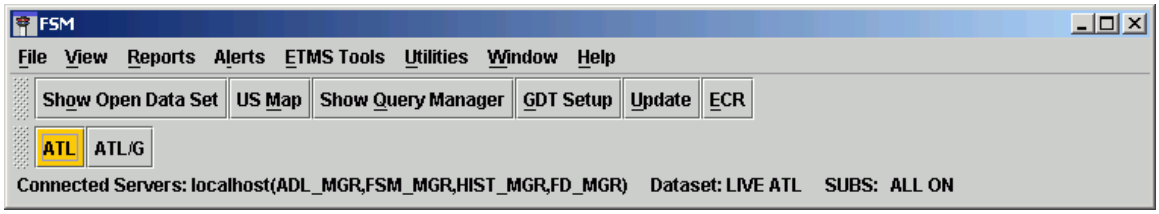

Figure 3-1: Control Panel Component

Control Panel Menu Bar

The menu bar in the Control Panel Component contains eight options: File, View, Reports, Alerts, ETMS Tools, Utilities, Window, and Help.

1. **File Menu**

File > *Open Data Set* - Opens the Open Data Set component, which allows you to open an airport in both *Live* and *Historical* data modes.

File > *Load Adaptation* - Loads a previously saved adaptation with your display preferences. For example, on a regular basis you monitor ATL airport with the Time Line and Bar Graph components displayed, you can save this configuration and select *Load Adaptation* to view the desired data in that format.

File > *Save Adaptation* - Saves your current windows management for an airport. This adaptation can be reopened later using File > *Load Adaptation*.

File > *Exit* - closes the *Control Panel* component and exits the FSM application.

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2. **View Menu**

View > *Status Map* - Opens the *US Map* component, to view airports currently being monitored by FSM. The Map component also displays when there is a TMI in place for any particular airport.

View > *GDT Setup* – Opens the GDT Setup components for a selected airport(s).

View > *Flight List* – Opens the Flight List for a selected airport.

3. **Reports Menu**

The **Reports** option gives you a choice of seven Count List Reports. Count Lists give you the option to check the flights that make up the arrival and/or departure demand for each hour. The Reports option can be accessed by first choosing an airport then selecting **Reports** > *Counts* > *"Count List Type"*. After selecting the desired *Count Type*, the Flight List title bar will display the Airport, date, ADL update time, and data mode used to generate the report. Count Lists are organized in 15-minute intervals with totals for each hour based on the *Time Line* totals. In Monitor Mode (*live*), all flights are displayed in the *Time Line* according to their ETA or ETD, depending on whether the flight is arriving at or departing from the selected airport. However, in GDT Mode, you can view Flight Counts by ETA, BETA, IGTA - Taxi, OCTA, CTA and EFTA.

> **Note**: When in GDT Mode, Count Lists will *only* display counts for arriving flights.

Figure 3-2 below is an example of **Report** > *Counts*> *By User* for CVG.

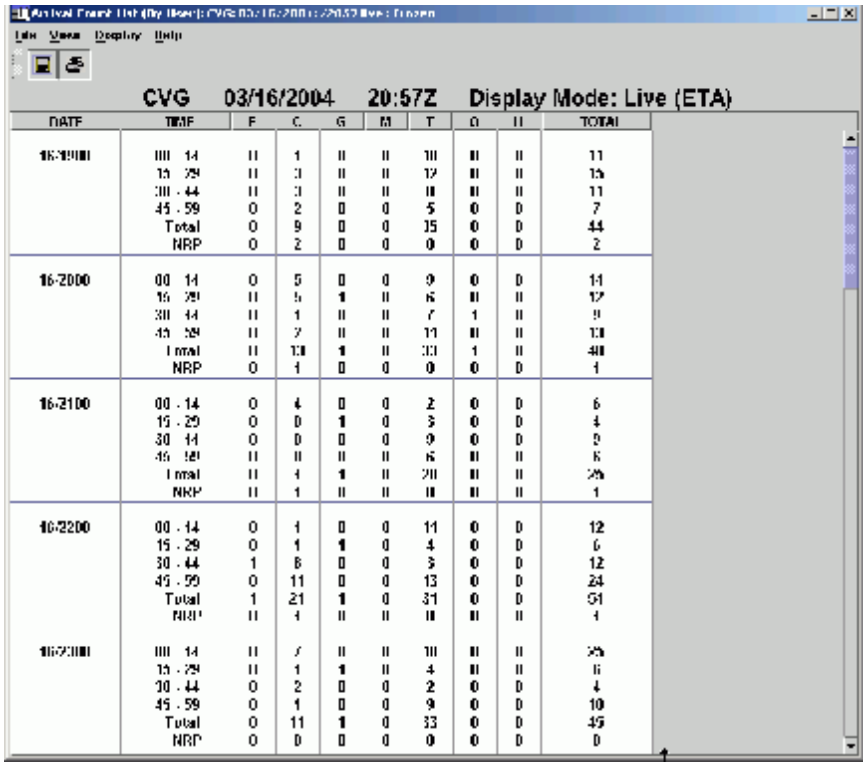

Figure 3-2: Arrival Count List > By User

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To increase the size of any Count List window, drag the edge of the window with your mouse. When the information contained in the window is too large for the window, you can scroll through the data by dragging the scroll bars located at the bottom and right-hand side of the window.

Under the Report Menu, there are seven Counts Lists:

Counts > By Demand - Displays arrival demand in 15-minute interval flight counts and totals the flight count for each hour. This is a quick way to check the arrival demand for each hour.

Counts > By Centers - Provides flight counts according to departure centers. There are 27 centers and "ZZZ," which includes any center not part of the initial 27. Again, in Monitor Mode, these counts are based on flights' ETA times, as displayed in the FSM Time Line**.**

Counts > By Aircraft Type - Displays a count list based on the aircraft type. Aircraft types are classified the same way as in the FSM Color By Aircraft Type option. That is, they are classified according to aircraft type as specified by the manufacturer.

Counts > By Aircraft Weight - Provides flight counts according to the aircraft weight. This Count List incorporates the same classifications for aircraft weight as FSM's Color By Aircraft Weight menu option.

Counts > By Arrival Fix - Provides flight counts according to the arrival fix each flight is arriving at for the monitored airport. Arrival fix names for each airport will vary. FSM automatically generates the correct Arrival Fix names for the monitored airports and uses them in the Count List headings.

Counts > By Departure Fix- Provides flight counts according to the departure fix each flight is arriving at for the monitored airport. Departure fix names for each airport will vary. FSM automatically generates the top 11 departure fixes for the monitored airport and uses them in the Count List headings. If the departure fix is other than these 11 or is unknown, the flight will be listed under the "Other" column.

Counts > By User - Provides a flight count according to the classification of the aircraft. Counts By User classifies flights according to their function in the NAS. There are 7 user types in FSM:

C - Air Carriers

T - Air Taxi

F – Freight/Cargo Carriers

M - Military

G - General Aviation

O - Other - This class includes flights that do not belong to one of the five categories listed above.

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U - Unknown - This category is reserved for flights which may fall into a user category, but whose classification is not known in FSM.

Under the Report Menu, there are five Compliance reports:

Compliance > *By CTD* – Flights included in a delay program that violate departure compliance. By default, flights that violate arrival compliance are defined as flights arriving more than 5 minutes before or 5 minutes after their Controlled Time of Departure (CTD). Any flight that has an ARTD of 5 minutes earlier or 5 minutes later than their CTD will trigger the CTD Compliance Alarm.

Compliance > *By ETE* – Difference between the ETE estimated by ETMS and actual flight time is greater than a specified value, but the flight status is not "cancelled."

Compliance > *By CTA* – - Flights included in a delay program that violate arrival compliance. By default, flights that violate arrival compliance are defined as flights arriving more than 5 minutes before or 5 minutes after their Controlled Time of Arrival (CTA).

Compliance > *Spurious Flights* – Flights submitted as UX Cancellations with no corresponding entries in the OAG.

Compliance > *Cancelled That Flew* – Flights submitted with a "Cancelled" status that flew at a later time within the program parameters.

When one of FSM's compliance alarms is triggered for a flight, FSM generates a list of flights that have triggered an alarm. Alarms are triggered in accordance with the reasons listed above:

Additional reports are generated when flights do not comply with certain criteria. In Monitor Live mode, these reports update automatically with every ADL for all airports whose data is being collected by the FSM data collector.

Note: The Report Lists will only include flights arriving at the active monitored airport.

Under the Report Menu, there are seven additional reports:

Reports > *Surface Delay* – This report indicates the ground delay imposed on flights and contains departure information for arrival and departure flights.

Reports > *Priority Flights* - This report identifies priority flights. It is similar to an FSM Flight List, but only lists flights specifically tagged as Lifeguard (LFG) or Diversion Recovery (DVT) flights.

Reports > *Time Out Delay* - The intent of the Time Out Delay Report is to quickly provide a picture for you of which flights from your operation are contributing to the Time Out delay problem. Easier access to this information should help you assess and resolve the problem. The format of this report is the same as the FSM Flight Lists which includes all flights with a delay status marked as `TO' (Time Out). Figure 3-3 illustrates a Time Out Delayed Flight List. Note that all the TOD column checkboxes are marked, indicating that all flights on the flight are Time Out Delayed.

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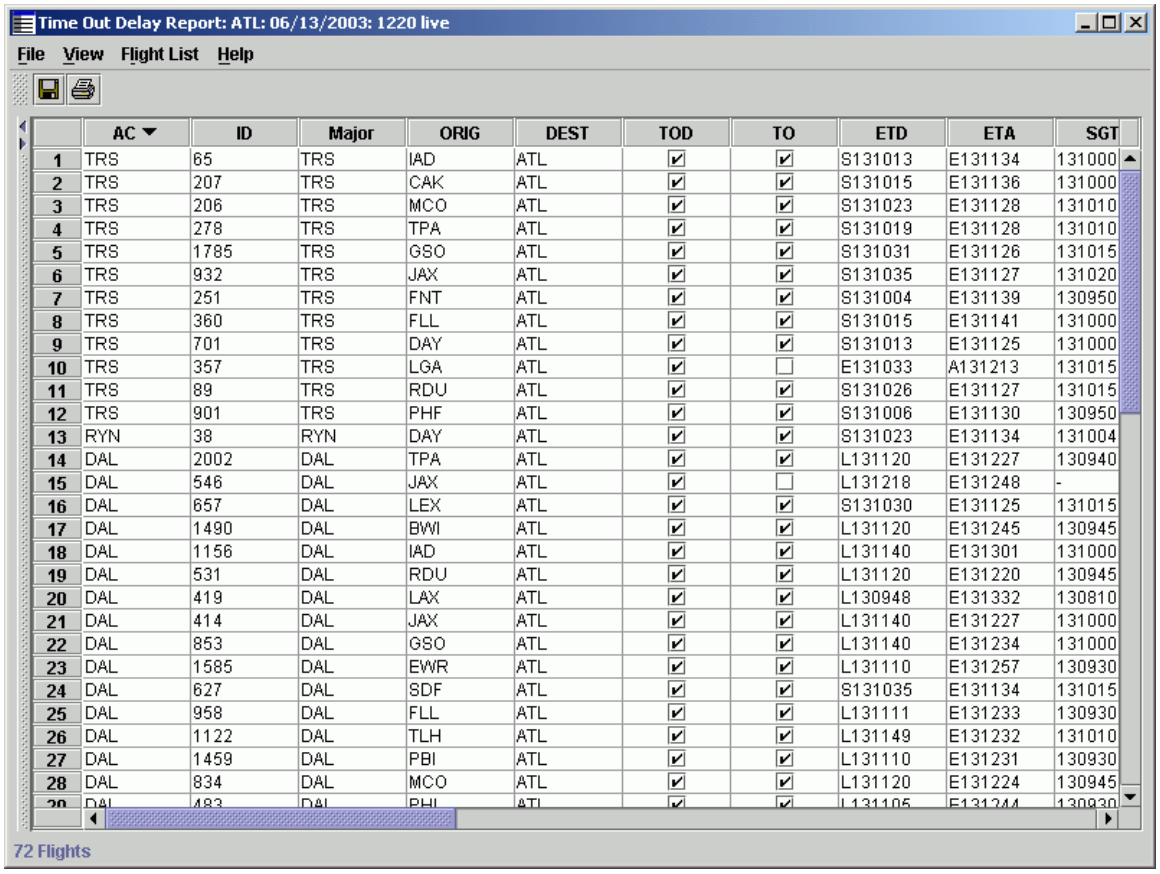
Note: When a Flight List is initially opened, the ADL data columns may need to be repositioned for easier viewing.



	AC	ID	Major	ORIG	DEST	TOD	TO	ETD	ETA	SGT
1	TRS	65	TRS	IAD	ATL	☑	☑	S131013	E131134	131000
2	TRS	207	TRS	CAK	ATL	☑	☑	S131015	E131136	131000
3	TRS	206	TRS	MCO	ATL	☑	☑	S131023	E131128	131010
4	TRS	278	TRS	TPA	ATL	☑	☑	S131019	E131128	131010
5	TRS	1785	TRS	GSO	ATL	☑	☑	S131031	E131126	131015
6	TRS	932	TRS	JAX	ATL	☑	☑	S131035	E131127	131020
7	TRS	251	TRS	FNT	ATL	☑	☑	S131004	E131139	130950
8	TRS	360	TRS	FLL	ATL	☑	☑	S131015	E131141	131000
9	TRS	701	TRS	DAY	ATL	☑	☑	S131013	E131125	131000
10	TRS	357	TRS	LGA	ATL	☑	☐	E131033	A131213	131015
11	TRS	89	TRS	RDU	ATL	☑	☑	S131026	E131127	131015
12	TRS	901	TRS	PHF	ATL	☑	☑	S131006	E131130	130950
13	RYN	38	RYN	DAY	ATL	☑	☑	S131023	E131134	131004
14	DAL	2002	DAL	TPA	ATL	☑	☑	L131120	E131227	130940
15	DAL	546	DAL	JAX	ATL	☑	☐	L131218	E131248	-
16	DAL	657	DAL	LEX	ATL	☑	☑	S131030	E131125	131015
17	DAL	1490	DAL	BWI	ATL	☑	☑	L131120	E131245	130945
18	DAL	1156	DAL	IAD	ATL	☑	☑	L131140	E131301	131000
19	DAL	531	DAL	RDU	ATL	☑	☑	L131120	E131220	130945
20	DAL	419	DAL	LAX	ATL	☑	☑	L130948	E131332	130810
21	DAL	414	DAL	JAX	ATL	☑	☑	L131140	E131227	131000
22	DAL	853	DAL	GSO	ATL	☑	☑	L131140	E131234	131000
23	DAL	1585	DAL	EWR	ATL	☑	☑	L131110	E131257	130930
24	DAL	627	DAL	SDF	ATL	☑	☑	S131035	E131134	131015
25	DAL	958	DAL	FLL	ATL	☑	☑	L131111	E131233	130930
26	DAL	1122	DAL	TLH	ATL	☑	☑	L131149	E131232	131010
27	DAL	1459	DAL	PBI	ATL	☑	☑	L131110	E131231	130930
28	DAL	834	DAL	MCO	ATL	☑	☑	L131120	E131224	130945

Figure 3-3: Time Out Delayed Flight List

Reports > *Time Out Cancel* **-** The intent of the Time Out Cancel Report is to quickly provide a picture of which flights from the operation are contributing to the Time Out cancel problem. Easier access to this information should help you review and resolve the problem. This report is in the same format as the FSM Flight Lists and includes all flights with cancellation status of `TO.' The format of the Time Out Cancel report is identical to the Time Out Delay report.

Reports > *Slot Hold* - This report is similar to an FSM Flight List, but only lists flights with their slot hold flag set to Y.

Reports > *Slot List*- Provides a slot list for a specified airport or an airline and its sub-carriers at a specified airport in the exact format that goes to the airlines.

Reports > *Sub Opportunities* **–** Provides a flight list to assist airlines and general aviation customers identify subbing opportunities.

Reports > *Carrier Statistics* **-** Opens a report displaying delay statistics for all carriers with flights operating at the specified airport. Only flights with arrival slots will be calculated in the report metrics. That is, flights with a Control Time of Arrival (CTA) will show up in carrier statistics. If a carrier operates at the airport, but has no flights with a CTA, the Carrier Statistics report will display "0"

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or "N/A" in those rows. You can choose the type of delay to view in the report by clicking **ABS Delay** (absolute delay) or **ATC Delay** (delay imposed only by the FAA) at the top of the report.

For more information on *Reports* see Chapter 7.

4. **Alerts Menu**

The **Alerts** option is used to notify you when new parameters are available for any airport you are currently monitoring. The **Alert** menu option will be highlighted in red when new or unviewed parameters are received for an airport(s) currently being monitored. In addition, the airport(s) and the type of parameters that have been updated will also be highlighted in red. The Alert menu will remain highlighted in red until all updated parameters have been viewed. To view the parameters, click on the highlighted alert and the parameters will be displayed in a separate text-formatted window. After the alert has been viewed the text will return to normal (no red highlight). If there are no updated parameters for an airport, the Alerts menu dropdown will indicate that there are No parameters, or "No Current Data Set" selected.

Note: If you select an airport with the letters GDP in the *Open Data Set* window, the *Control Panel* **Alerts** menu will be highlighted in red for that airport.

The Control Panel Alerts are listed below:

Alerts > *FADT Parameters Available* – This alert does not actually give you program parameters. However, you can view a listing of all the FADTs generated during each FDP. FADTs are reports generated when a Ground Delay Program, Ground Stop, Blanket or Compression operation is run. FADTs are listed in chronological order.

Alerts > *SCS Bridge* This alert turns red in color when there has been a new SCS update. Selecting SCS Bridge will display the current subbing status and may contain the following keywords:

- **SUBS:** Indicates whether all substitutions are enabled (ON) or disabled (OFF).
- **SCS:** Indicates whether slot credit substitutions for all operators are enabled (ON) or disabled (OFF).
- **BRIDGING:** Indicates whether bridging subs are disabled (OFF) for a particular operator (airline name, GA, or MILITARY). If bridging is off for an airline, any flight whose MAJOR field or carrier code (from ACID) matches the airline name will not be used for an SCS bridge. If bridging is enabled (ON) for an operator, no line will appear, that is, the only allowed value for this keyword is OFF.

Alerts > *Actual GDP Parameters Available* – This alert turns red in color when Actual GDP Parameters are received through the ADL. First-time GDP Parameters, new GDP Parameters and deleted GDP Parameters will trigger this

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Alert. Click on *Actual GDP Parameters Available* to view these parameters in a text window.

Alerts > *Proposed GDP Parameters Available* - This alert turns red when parameters for a Proposed GDP arrive through the ADL. Click Proposed GDP Parameters Available to view the newly proposed parameters.

Alerts > *GS Parameters Available* – This alert turns red in color when a Ground Stop is issued and its parameters are received through the ADL. First-time GS Parameters, new GS Parameters and deleted GS parameters, all will trigger this Alert. Click GS Parameters to view the parameters in the GS Parameter Display panel, which is similar to the GS Setup Panel. From the GS Parameter Display panel, you may save the parameters to a file or close the window.

Alerts > *Compression Parameters Available* – This alert is triggered when parameters for the compression function are received through the ADL. When Compression parameters arrive, Compression Parameters turns red in the Alert menu. Click on the red text to view the new parameters.

Alerts > *Blanket Parameters Available* – This alert is triggered when parameters for a Blanket function are received through the ADL. When Blanket parameters arrive, Compression Parameters turns red in the Alert menu. Click on the red text to view the new parameters.

5. **ETMS Tools**

The **ETMS Tools** dropdown menu contains seven main core options: *EDCT Commands, Command Line, Weather Request, ADL Request, ADL Arrival Rate, ADL Departure Rate,* and *Delete GDP Parameters.*

ETMS Tools > *EDCT Command* options:

> *EDCT CHECK* – Displays the current status of a single flight controlled by an EDCT program. When you issue this command, you get a one-line response showing the controlled departure time and whether the ETMS has issued a Controlled Time (CT) message to implement the control for this flight.

> *EDCT CNX* - Creates a report of all flights cancelled in EDCT programs for selected airports or a report only listing cancelled flights for specified airlines for selected airports.

> *EDCT CTA LIST* – Creates a report of all controlled and cancelled flights for an airport and/or an airline at an airport, as well as open slots.

> *EDCT HOLD* - Holds all slots in a ground delay program (GDP) for all flights or only the flights belonging to a specified airline and its sub-carriers at a specified airport.

> *EDCT LIST* – Creates a report containing a list of all airports currently controlled by EDCT programs.

> *EDCT LOG* - Creates a report of all EDCT files, cancellation messages, Simplified Substitution processing (SS) messages, and EDCT updates

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processed by the system in the order they were received. Only traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) can use this command.

> *EDCT PURGE* - Purges EDCT flight controls for a specified airport or for all airports.

> *EDCT RELEASE* - Releases all slots in a GDP for all flights or only the flights belonging to a specified airline and its sub-carriers at a specified airport.

> *EDCT SCS OFF* - Suspends slot credit substituting for flights controlled by EDCT programs at a specified airport or at all airports. To allow slot credit processing after suspending slot credit substituting, you must activate processing with the **EDCT SCS ON** command. *Only traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) can use this command.*

> *EDCT SCS ON* - Allows slot credit substituting for flights controlled by EDCT programs at a specified airport or at all airports. To prohibit slot credit substituting, you must suspend processing with the **EDCT SCS OFF** command. *Only traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) can use this command.*

> *EDCT SHOW* - Creates a report that contains detailed information on all flights controlled by EDCT programs for a specified airport, or for all airports.

> *EDCT SLIST* - Provides a slot list (using the same format that goes to the airlines) for a specified airport or an airline and its sub-carriers at a specified airport.

> *EDCT SLOTS* - Creates a report list of all open slots for airlines at specified airports.

> *EDCT SUB OFF* - Suspends Substitution processing (SI) messages for flights controlled by EDCT programs at a specified airport or at all airports.

> *EDCT SUB ON* - Allows Substitution processing (SI) for any flights controlled by EDCT programs at a specified airport or at all airports where substitution processing was previously suspended.

> *EDCT SUB SHOW* - Generates a report that shows the status of simplified substitution processing (SS) messages for all airports. *Only traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) can use this command.*

> *EDCT UPDATE* - Allows you to update a controlled flight with new departure and arrival times. After you issue this command, you get a one-line response stating that the update was successful. *Only traffic management specialists at the Air Traffic Control System Command Center (ATCSCC) can use this command.*

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> *EDCT REMOVE*- Allows you to remove flights from the ETMS database, as if they never existed. Using this command can eliminate a duplicate flight or remove a specific incorrect flight. *Only Computer System Analysts (CSA) at the Air Traffic Control Systems Command Center (ATCSCC) can use this command.*

> *EDCT RESTORE* - Allows you to "undo" the effects of the Remove command. It allows some or all of the flights that you did not want to remove from the database to be restored. *Only Computer System Analysts (CSA) at the Air Traffic Control Systems Command Center (ATCSCC) can use this command.*

ETMS Tools > *Command Line* – Displays a dialogue box which allows the user to enter any EDCT FAA commands. This feature is used only by the FAA and provides additional information about controlled flights and airports.

ETMS Tools > *Weather Request* - Allows you to request current airport *weather (METAR and TAF)*

ETMS Tools > *ADL Request* - Allows you to request a new ADL generated from the hub site.

ETMS Tools > *ADL AAR* - Allows you modify and reset ADL Arrival Rates including the ability to assign several different AARs within the same hour.

ETMS Tools > *ADL ADR* - Allows you modify and reset ADL Departure Rates including the ability to assign several different ADRs within the same hour.

The *Modify AAR* and *Modify ADR* windows have identical setup features. The next figure is an example of the **ETMS Tools** > *ADL AAR Rate/ADL ADR* > *Modify* option window.

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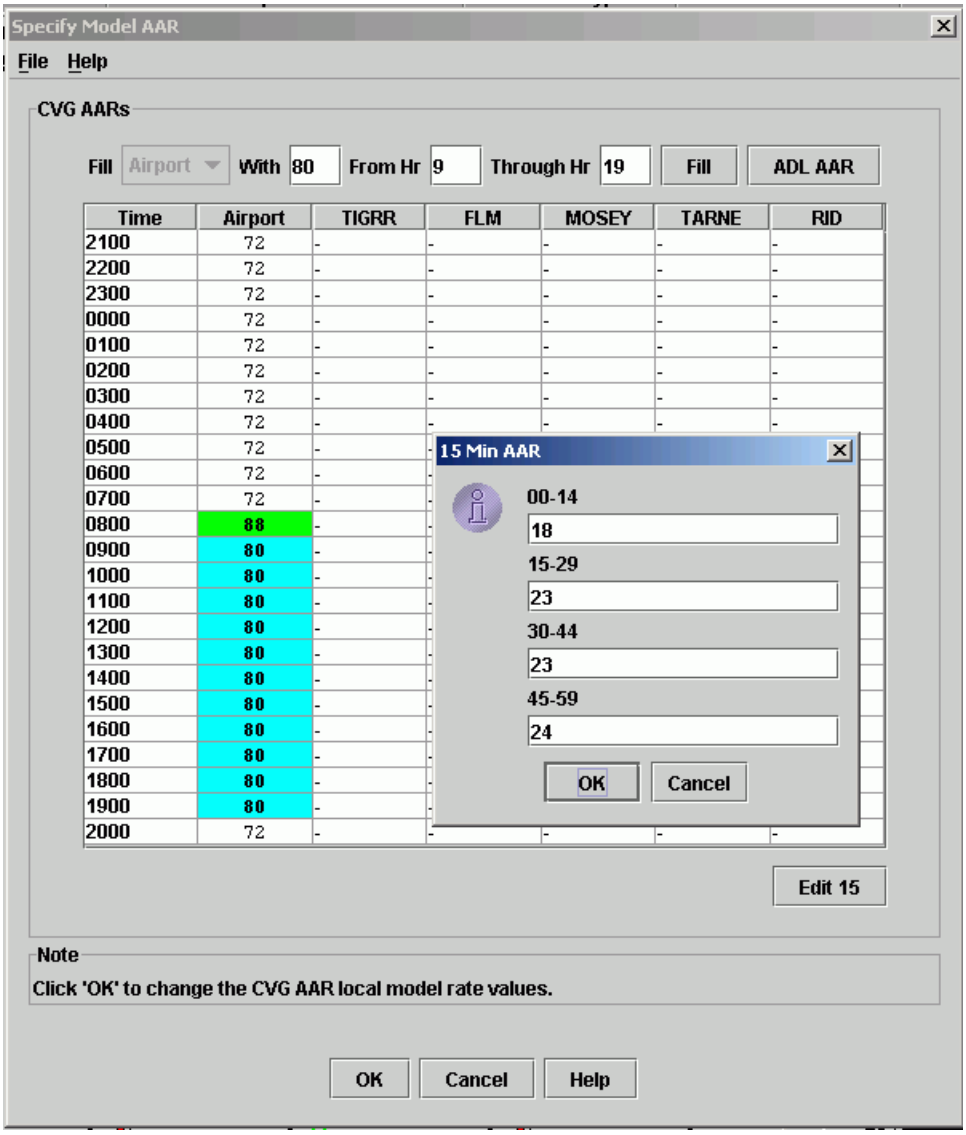

Figure 3-4: Specify Model AAR Window

Modify AAR/ADR Window Menu

File > *Open*- Opens previously saved AAR/ADR parameters.

File > *Save* - Saves the AAR/ADR parameters to a text file (can be opened later and used again).

File > *Print* - Prints the Modify AAR/ADR window.

File > *Close* - Closes the Modify AAR/ADR window.

Help > *Demand Rates* **–** Opens the online help information specific to the modifying demand rates.

To modify rates, enter the new value in the **With** text box then type in the hours in the **From Hr** and **Through Hr** text boxes to reflect the duration of the new AAR/ADR. Click **Fill** to automatically fill those hours. This is a helpful option when you need to fill a block of hours with one rate.

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To fill a single hour with multiple AAR/ADRs, click on the airport cell you want to modify, click the **Edit 15** button in the lower right-hand corner of the rates table, or right-click on an active cell in the Airport column. This brings up the *15 Min AAR/ADR* dialog box that allows you to assign AAR/ADRs in 15-minute increments for that hour. For example, the figure 3-5 below illustrates an AAR of 65, but for the first fifteen minutes the airport can take 17 flights. Therefore, an AAR of 16 is assigned for the remaining 15-minute time increments. You can assign any value for each 15-minute increment as long as the total equals the overall AAR/ADR value for that hour. Click **OK** to change the 15-minutes increments for that hour or **Cancel** to close the window.

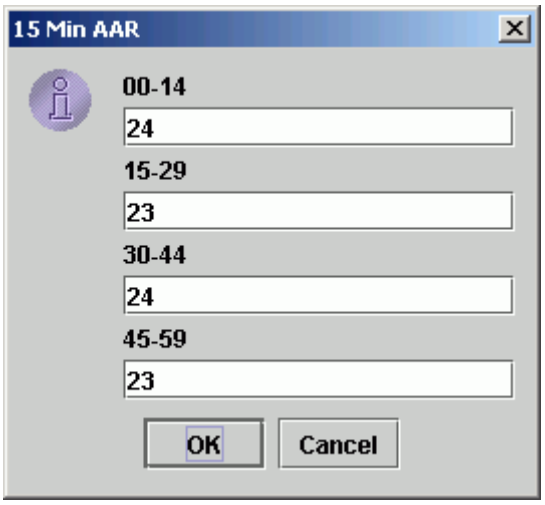

Figure 3-5: 15 Min AAR dialog box

Depending on the AARs you assign within an hour, that hour's AAR background color will change.

Green indicates that the AAR is distributed unevenly among the 15-minute increments in that hour. **Blue** indicates that the 15-minute AARs do not differ from each other by more than a value of "1." **White** indicates that the AAR for that hour is the same as the ADL AAR. **Red** indicates that the AAR is more than twice the value of the default AAR.

Once you have finished entering your AAR/ADR information, click **Send** from the Modify Rates window to send the modified rates to ETMS. The next ADL update will reflect the new rates. Clicking **Cancel** will close the modify AAR/ADR rates without taking any action. Click the ADL AAR/ADR button at the top right of the Modify window to reset the rates back to what the original AAR/ADR rate when you first opened the window.

Clicking **Help** at anytime will give you a description of both the **Send** and **Cancel** buttons.

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The *Reset AAR* and *Reset ADR* windows have identical setup features. The figure below is an example of the **ETMS Tools** > *ADL AAR Rate/ADL ADR* > *Reset* option window.

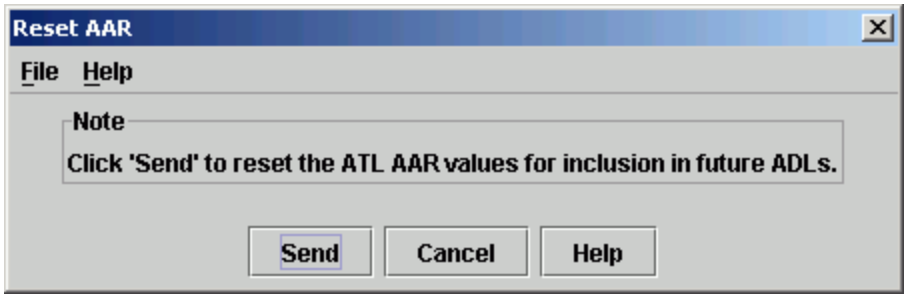

Figure 3-6: Reset AAR Window

Reset AAR/ADR Window Menu

File > *Close* - Closes the Reset AAR/ADR window.

Help > *Demand Rates* **–** Opens the online help information specific to the modifying demand rates.

When in historical Mode, pressing **Send** resets the historical data to the first ADL update time. In Monitored Mode, pressing **Send** will reset AAR/ADR values to the default setting and send the information to ETMS. The reset AAR/ADR will then be reflected in the next ADL update. Pressing **Cancel** will close the Reset AAR/ADR window without taking any actions and pressing **Help** provides you with a popup screen with additional information on the Send and Cancel buttons.

ETMS Tools > *Delete GDP Parameters* – Opens the Delete GDP Parameter dialogue box. (see Figure 3-7). Select the airport you wish to delete GDP parameters from the For Data Set drop down menu

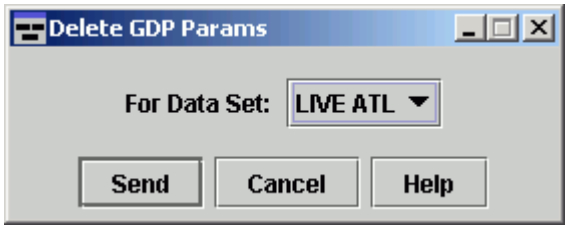

Figure 3-7: Delete GDP Params Window

6. Utilities Menu

Utilities > *Query Manager* – Opens the Query Manager component.

Utilities > *Search By Call sign* – Opens the Search By Call sign window.

Utilities > *Model Arrival Rates* - Opens the Model Arrival Rates window allowing you to specify and reset Model Arrival Rates and the ability to assign several different AARs within the same hour.

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Utilities > *Model Departure Rates* **-** Opens the Model Departure Rates window allowing you to specify and reset Model Departure Rates and the ability to assign several different ADRs within the same hour.

You have the option to model AAR and ADR from the Bar Graph component, but rates can only be modified from the Modify AAR/ADR window, which is accessed from the Utilities menu option on the Control Panel. When modeling an AAR/ADR from the *Bar Graph*, the Modify AAR/ADR window automatically reflects the modeled rates. Then the model rates can be sent from the Modify AAR/ADR window to ETMS and reflect in the next ADL update. This method of changing the AAR or ADR is used when there is no GDP being sent.

Utilities > *View File* – This option allows you to view previously saved Analysis Reports, Coversheets and Flight Data, as shown in Figure 3-8..

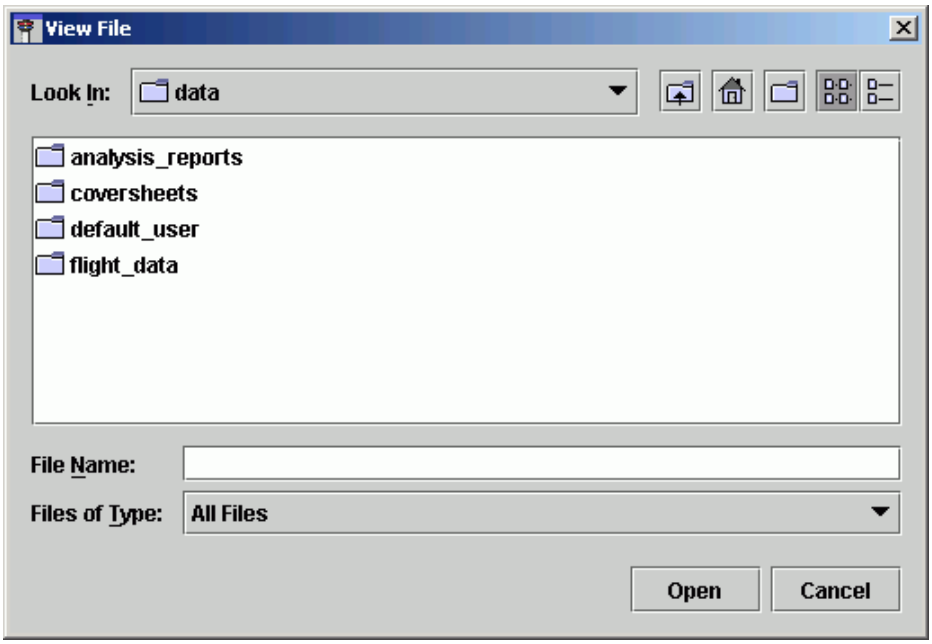

Figure 3-8: View File Window

Utilities > *Set Time* – Allows you to set a specified time for Historical data sets only.(See Figure 3-9).

Figure 3-9: Set Time Dialog Box

Utilities > *Update* **-** Updates the active historical mode components with the next historical ADL file.

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Utilities > *ECR* – Opens the ECR component to update a controlled flights control times.

7. Window Menu

Window > *Hide All Windows* - Hides all open FSM components.

Window > *Hide All Iconified Windows* - Hides all FSM iconified bars displayed in the Task bar.

Window > *LIVE (+ airport abbreviation), GDT yyyy/mm/dd/Airport, or HIST yyyy/mm/dd/airport.* – Click the data mode and airport selection to open the active components for that airport. Each individual component is listed under the **Window** menu. Select a checkbox to display and bring to the front of your monitor the subsequent airport component. Airport and Data selections will be consecutively numbered in the order they were opened.

8. Help Menu

Help > *FSM* – Accesses the web-based FSM on-line help.

Help > *Show Configuration* – Displays current FSM configuration in use. See Figure 3-10.

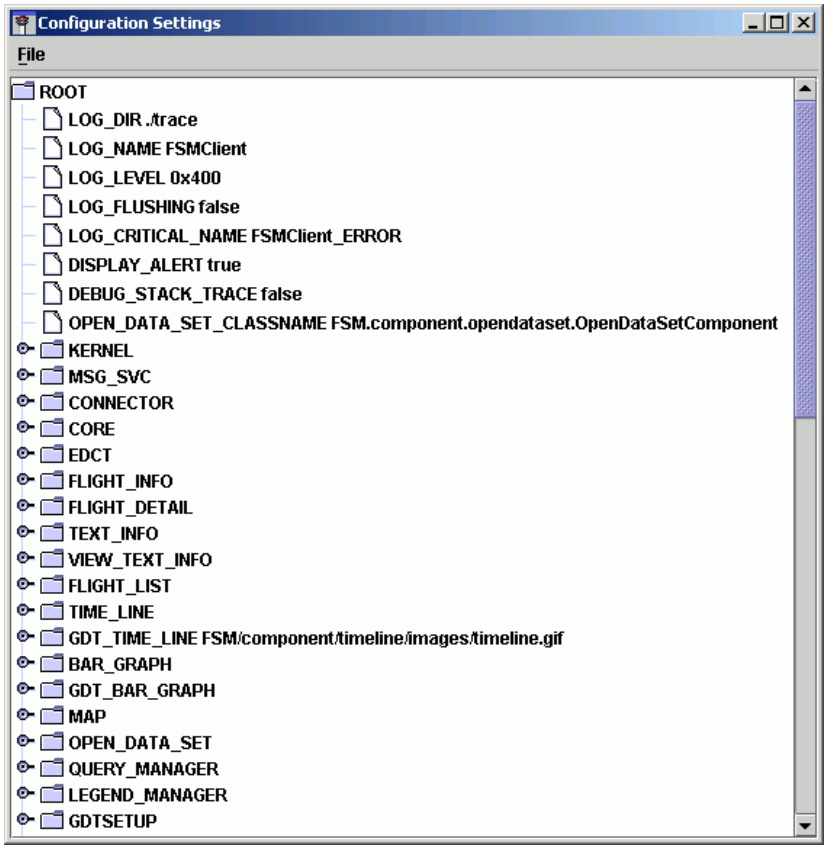

Figure 3-10: Configuration Setting Window

Help > *About FSM* - Displays information about the FSM version running. Included in the *About FSM* are:

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- FSM Version and Copyright Information – The version of FSM currently running (i.e. FSM 7. 8.1), Metron Aviation, Inc. copyright notice, the software build-date and Product License information are included in this window.

Opening Other FSM Components from the Control Panel

To open other FSM components, use the buttons from the *Control Panel* component.

1. **Show Open Data Set**

The **Show Open Data Set** button opens the *Open Data Set* component in which the user may select various operating modes and available airports. See *Open Data Set* component overview for more detail.

2. **US Map**

The **US Map** button opens the *US Map* Component, which displays airports currently being monitored and their status in their respective geographical locations. See US Map component for more detail.

3. **Show Query Manager**

The **Show Query Manager** button opens the *Query Manager* component that lists Built-in and User-defined filters. See the *Query Manager* component information below for more detail.

4. **GDT Setup**

The **GDT Setup** button opens four GDT components: *GDT Setup, GDT Map, GDT Bar Graph,* and *GDT Data Table* components. An airport must already be opened for the *GDP Setup* component to be activated. If there is no data set selected, the **GDT Setup** button will display an error message (by default). See Chapter 4 for detailed information on Ground Delay Tool Components.

5. **Update**

The **Update** button allows you to update the *Time Line* and *Bar Graph* with the next ADL update only in Historical Mode. An airport must be opened in Historical mode for the **Update** button to operate. If there is no Historical data set selected, pressing the **Update** button will cause an error message: “Not a historical data set”.

6. **ECR**

The **ECR** button opens the ECR components. ECR is used to update EDCTs for flights arriving into a controlled airport. See Chapter X for detailed information on the ECR component functionality.

Open Data Set Component

Selecting the **Show Open Data Set** button from the *Control Panel* opens the *Open Data Set* component. This component allows you to choose an FSM data mode and data set for monitoring and managing air traffic flow. A *data mode* is the type of data you want to use: *historical* or *live*. Live data is fed to the FSM client on a real-time basis, while

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historical data is archived data that can be pulled to review airport events in the past. A *data set* is the airport and the components with which you would like to display.

- **Monitored Live** - Monitored Live provides a list of airports currently monitored by the FSM server and readily available for viewing by the user. This data mode runs real-time data and receives ADL updates every 5 minutes while running FSM.
- **Historical** - This data mode uses historical data that has been stored in a database. Historical data is available for recall to analyze scenarios or replay a day's air traffic events.
- **All Live** - All Live provides a list of airports that can be viewed by the user (not currently being monitored by the server, but available).
- **Active Historical** – The Active tab provides a list of airports historical data currently opened and monitored by the user.

Note: All times displayed in and used by FSM are Zulu times unless otherwise specified.

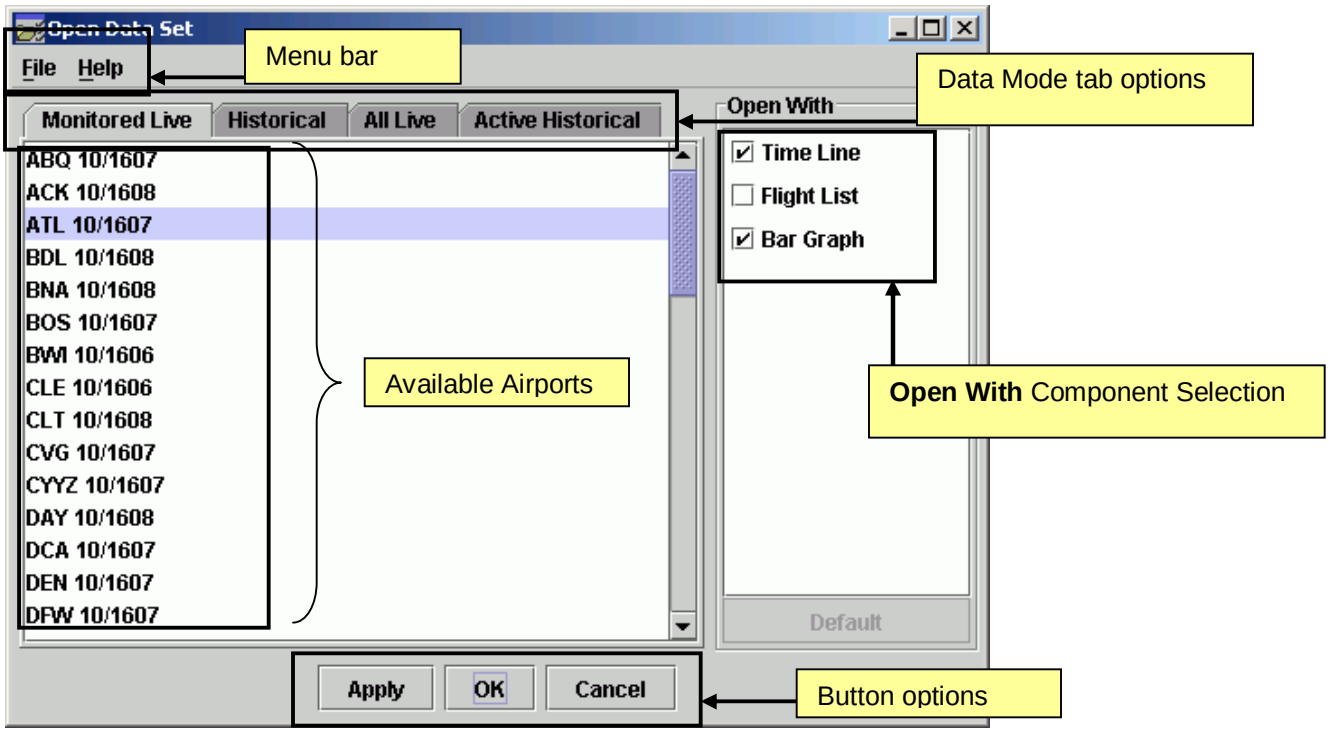

Figure 3-11: Open Data Set Component

Open Data Set Menu Bar

The Menu Bar in the *Open Data Set* component contains two options: File and Help.

1. **File Menu**

File > *Close* – Closes the *Open Data Set* component.

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2. **Help Menu**

Help > *Open Data Set* – Accesses the web-based on-line help for the *Open Data Set* component.

Open Data Set Tab Options

The Tab Options in the Open Data Set window consists of four tab selections, Monitored Live, Historical, All Live, and Active.

1. **Monitored Live Tab**

The Monitor Live tab provides a list of airports currently monitored by the FSM server and is readily available for viewing by the user. GDP Actual or GS Actual along with the program times will be displayed next to airports with a TMI in place. Select the desired data set by clicking the airport information in the scrolling area of the window and then click on the components you wish to view under the **Open With** area of the window. If the user under the **Open With** checkbox options does not make a selection, FSM will display the two default components; *Time Line* and *Bar Graph*. Click **Apply**, **OK**, or double-click the highlighted airport to display the information. For example, Figure 3-12 shows ATL airport, which has a GDP in place, with the *Time Line* and *Bar Graph* selected; this will open the *Time* Line and *Bar Graph* components for ATL in monitored live mode.

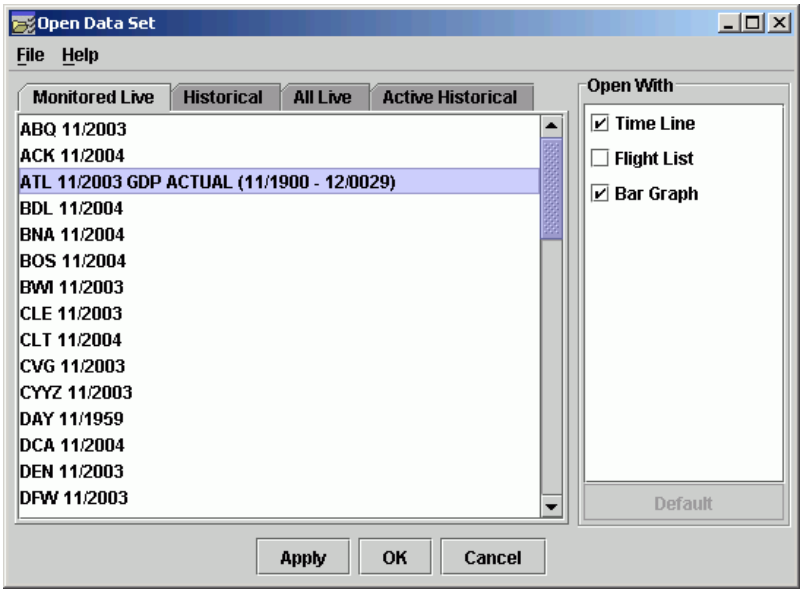

Figure 3-12: Open Data Set - Monitored Live Tab

2. **Historical Tab**

When you initially open the *Open Data Set* component, the Monitored Live tab is displayed by default. To select the Historical data display, click on the Historical tab. This display will provide you with the available historical data archived in FSM. You can select your historical data by drilling down from the server you wish to pull data from. The drill down order is arranged by Server>Year>Month>Day>Airport. If the FSM Client is connected to two

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servers, both servers will be listed. After the Data set has been selected you can choose which components you wish to view with the **Open With** checkbox options. The *Time Line* and *Bar Graph* components will display by default if the user doesn't make any changes. After the data set and component selections have been made, press the **Apply** or **OK** button to display the information. See Figure 3-13.

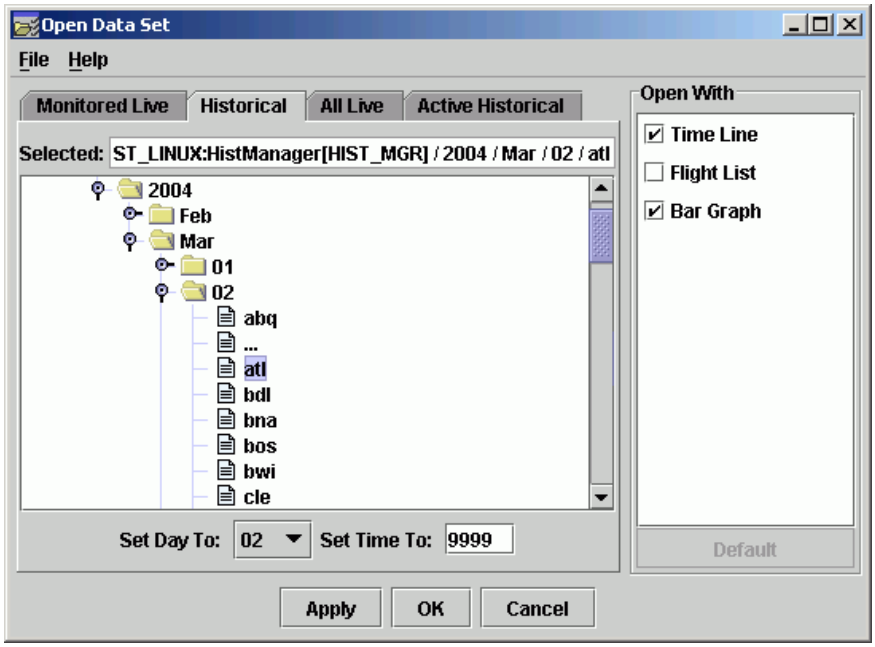

Figure 3-13: Open Data Set - Historical Tab

3. **All Live**

The All Live tab provides a list of airports that can be viewed by the user. An airport dataset selected from the All Live initially takes slightly longer to open than from the Monitored Live tab. When selected, the airport's 3-letter code is highlighted in light purple.

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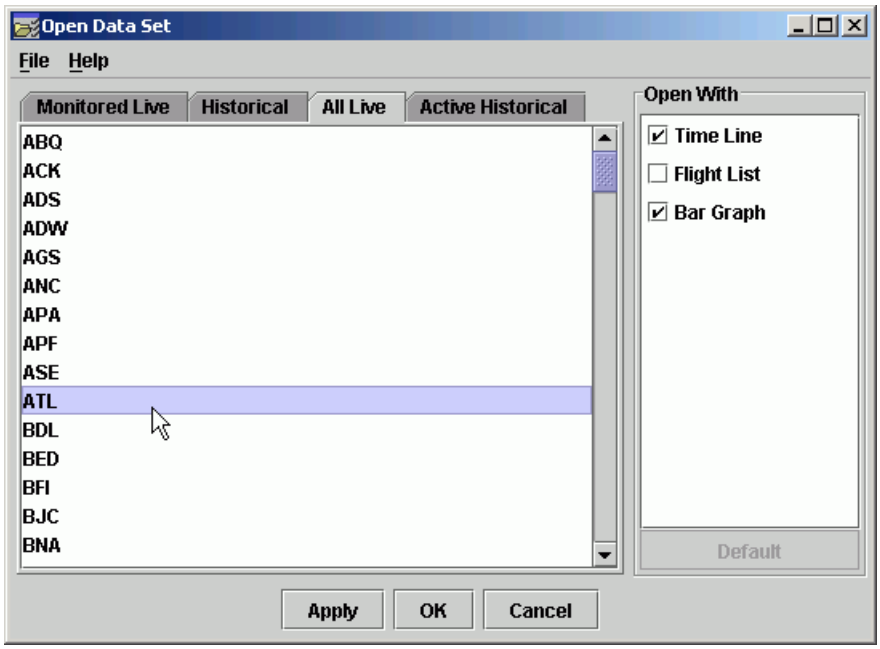

Figure 3-14: Open Data Set - All Live Tab

4. **Active Historical**

The Active Historical tab provides a list of airports currently open in Historical mode that are being monitored by the user. You can open additional components or toggle from one historical data set to another from this Tab.

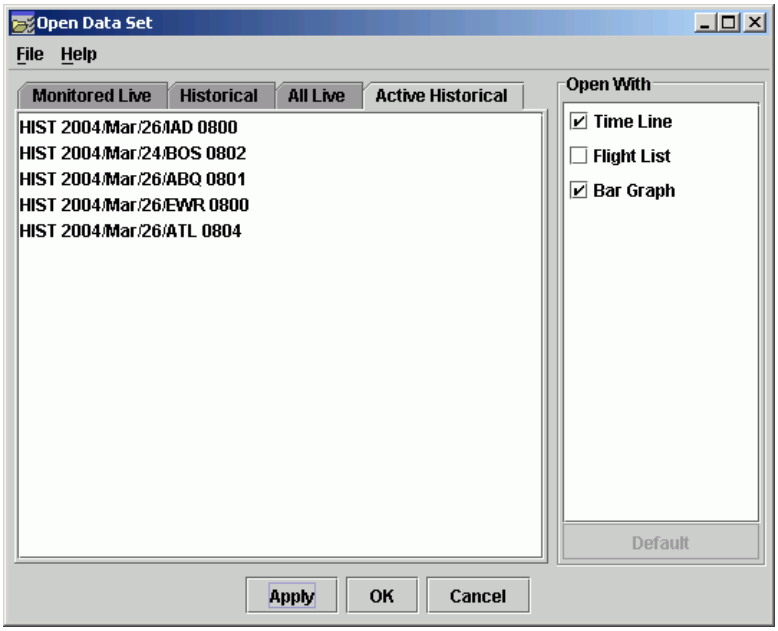

Figure 3-15: Open Data Set - Active Historical Tab

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Opening Components from the *Open Data Set* component

The **Open With** portion of the *Open Data Set* component contains three component options to open and view an airport with: *Time Line, Flight List, and Bar Graph* components (see Figure 3-16). You may select the desired component(s) to open a selected airport by placing a checkmark in the associating checkbox of the **Open With** component. If you do not make any changes in the **Open With** component, the *Time Line* and *Bar Graph* components for the selected airport open by default.

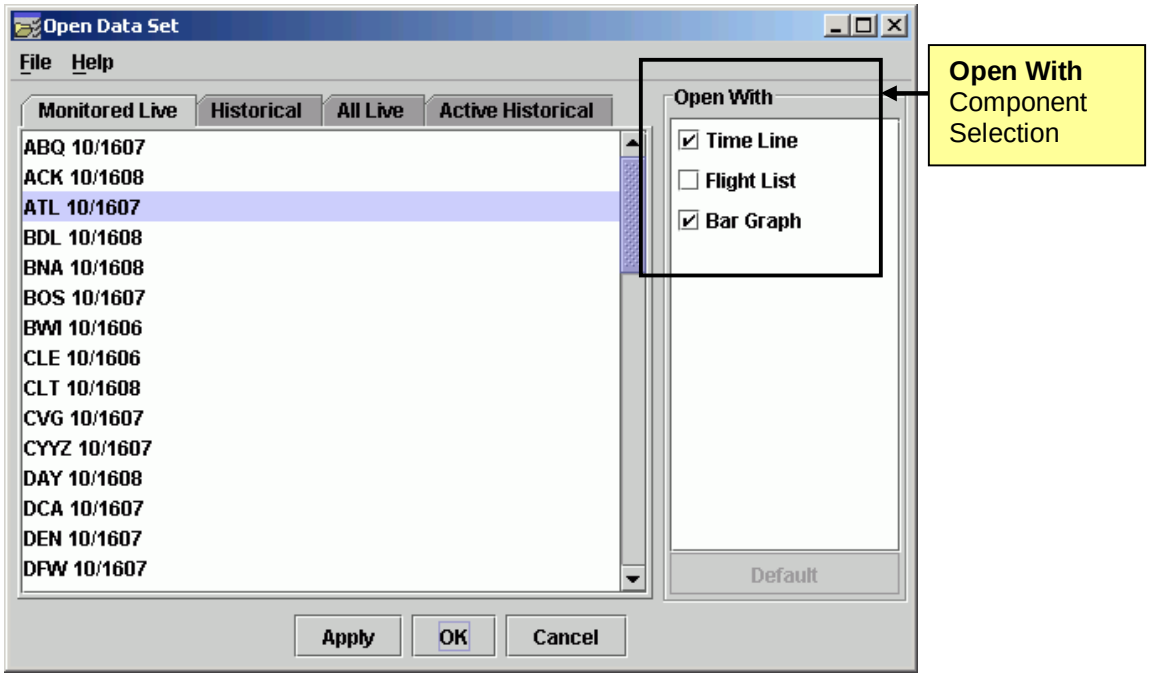

Figure 3-16: Open With Component Selection

Open With Component Options

1. **Time Line**

   The Time Line checkbox, when checked, opens the *Time Line* component of the selected airport, displaying regular *Time Line* options for each airport.

2. **Flight List**

   The Flight List checkbox, when checked, opens the *Flight List* component of the selected airport.

3. **Bar Graph**

   The Bar Graph checkbox, when checked, opens the *Bar Graph* component of the selected airport.

The **Default** button allows the user to return to the previously checked (default) items in the **Open With** ; the Time Line and Bar Graph checkboxes are selected.

Open Data Set Button Options

1. **Apply**

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The **Apply** button keeps the *Open Data Set* component active in addition to opening the selected airport components.

2. **OK**

The **OK** button closes the *Open Data Set* component when opening the selected airport components.

3. **Cancel**

The **Cancel** button cancels any selections made and closes the *Open Data Set* component.

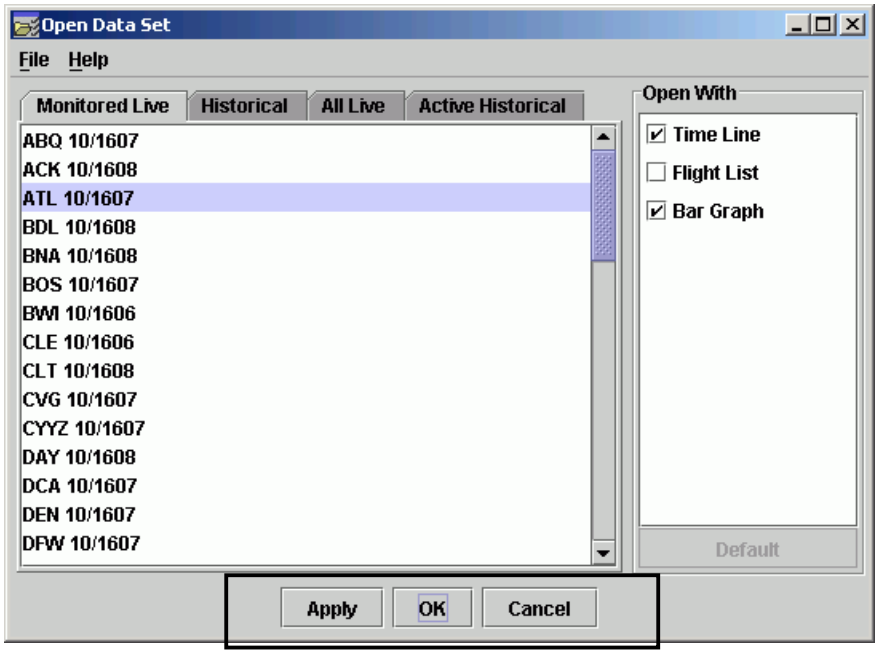

Figure 3-17: Open Data Set Button Option

Map Component

The *US Map* component can be viewed by pressing the **US Map** button from the *Control Panel* Component. The *US Map* displays North America with an overlay of all US and Canadian centers and an outline of the 48 contiguous states. Airports currently being monitored by the server are displayed with the airport three-letter identifier (US) or four-letter identifier (Canada) and a colored dot indicating the status of each airport. The number of monitored airports listed on the *US Map* is indicated in the title bar; **monitored data sets: 52** indicates that 52 airports are currently being monitored and displayed on the Map. If there are no Traffic Management Initiatives (TMIs) for the airport, it will be colored green. If there is a Ground Delay Program or Ground Stop in effect, the airport will be colored Red. If there is either a proposed GDP or Ground Stop, the airport will be colored yellow. The Map provides a quick view of airports you are monitoring and their status. See Figure 3-18.

Note: An airport will be colored blue for up to 6 hours after a TMI has finished and the purge command was not used. If a TMI was purged, then

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the airport color will turn back to green because the parameters are no longer in the ADL data.

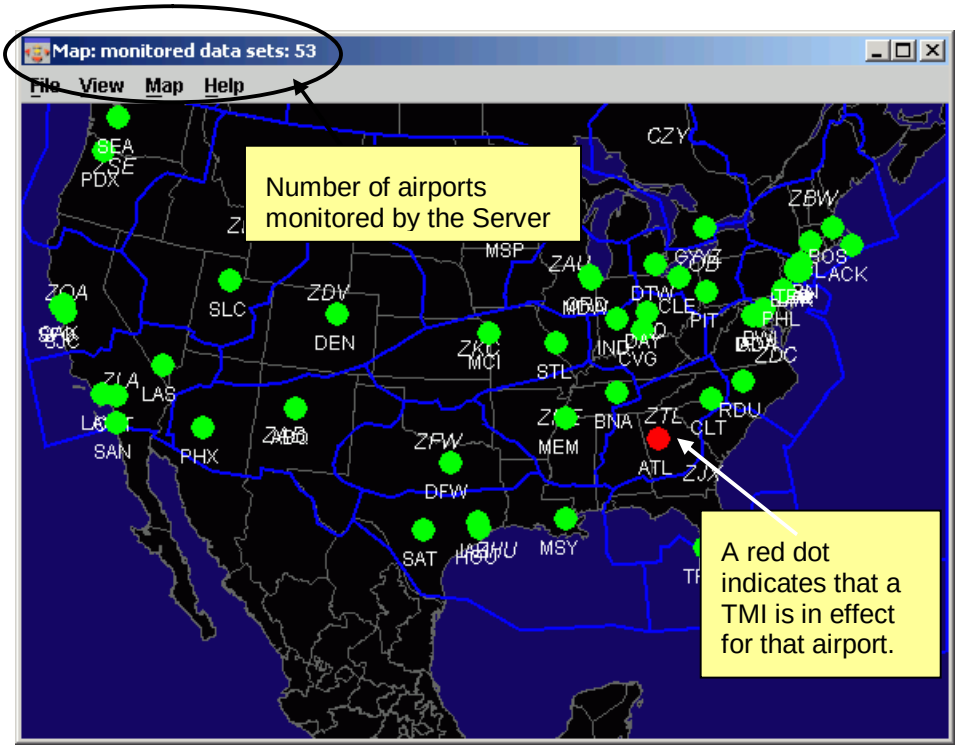

Figure 3-18: US Map component

Map Zoom Capabilities

There are several different ways to zoom in or zoom out on the *US Map* or *GDT Map* components, each having their own method.

Quick Key Method

Using Z on your keyboard will incrementally *zoom in* to the center of your screen. Likewise, using U on your keyboard will incrementally *zoom out* from the center of your screen. To move the center focus of your screen to another focal point or to zoom in on a particular airport, move the cursor to the desired location and press M on the keyboard. Quick key M will move the central focus of the map to the cursor location. To zoom in/out from that point, continue to use Z or U quick keys. In addition, pressing X on the keyboard will undo last command (up to 25 commands).

Table 3-1: Quick Key Commands

Quick Key	Description
M	Move
Z	Zoom in

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Quick Key	Description
U	Zoom out
X	Undo Move/Zoom

Drag and Drop Method

To zoom out, hold down the left mouse button and drag the curser up and left. The larger you draw the box; the further out the zoom will be. To zoom in, hold down the left mouse button and drag any direction, besides up and left, around the area you wish to zoom in on.

Right Click Method

After using either method listed above, right-clicking the mouse anywhere within the Map component will give you two options: Default zoom and undo zoom. Default zoom will return the Map zoom to the initial zoom setting. Undo zoom, will undo the last zoom command, same as using the X quick key.

Note: The Drag and Drop Method is not precise, it is recommended to use the Quick Key Method.

Viewing Airport Parameters

From the US Map, you can view the scope of an airport's TMI parameters.
Left click an airport that has either proposed or active parameters in place and the parameters are graphically displayed (see Figure 3-19). The maroon overlay and red airports indicates area and airports included in the airport's TMI.
In addition to the graphical parameters display, white text will display the airport ID, date and ADL time, the type of program, and the program time range. To return to the normal Map display, click anywhere on the map.

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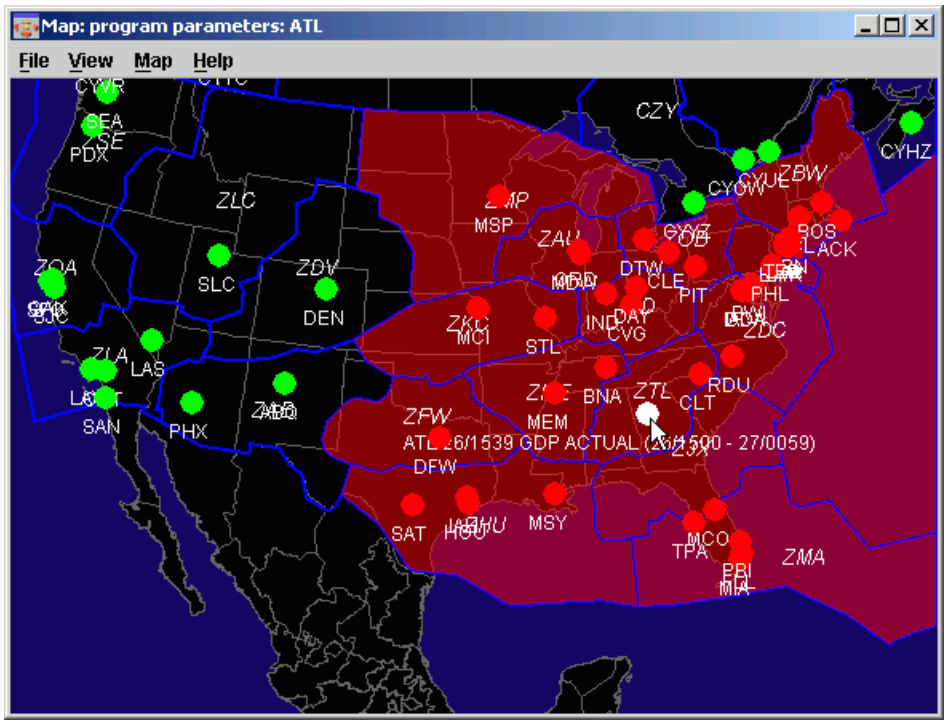

Figure 3-19: View Airport Parameters

Opening Components from the US Map

You can access an airport's *Time Lime, Bar Graph,* and *Flight List* components directly from the *US Map* component. Left-click the airport, this turns the airport white in color and if the airport is running a TMI, the parameters will be graphically displayed in the Map, similar to the GDT Map display. Once you have selected an airport, right-click on the airport to display the pop-up selection menu, which includes the zoom option described above as well as the option to view the *Time Line, Bar Graph,* or *Flight List* component for the selected airport in monitor mode only. For example, selecting *Show flights in time line…*will open up the Time Line live component for ATL.

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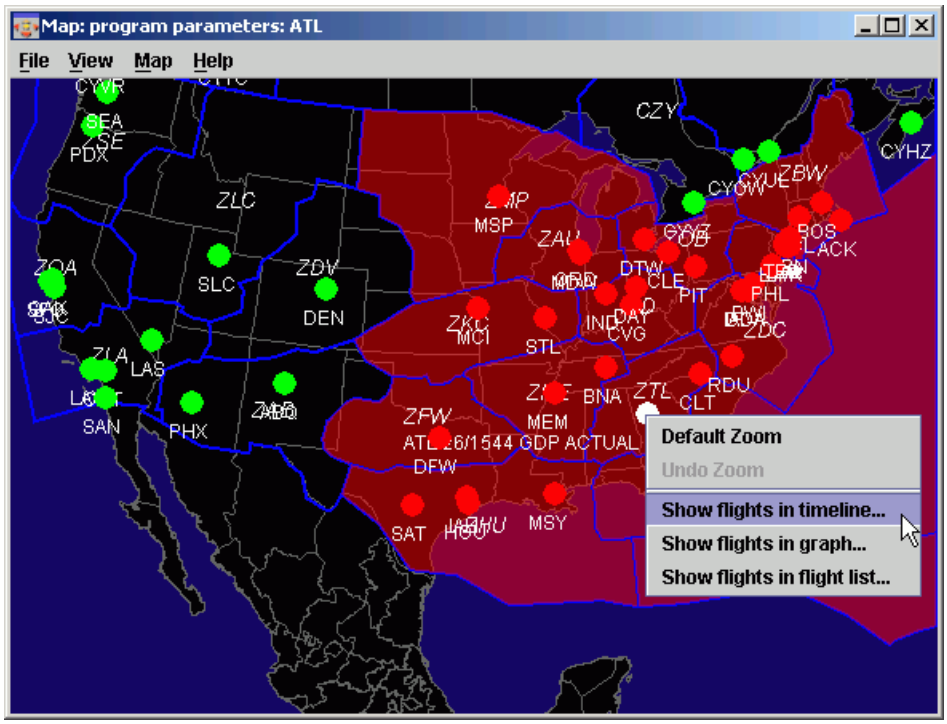

Figure 3-20: Component Selection

US Map Menu Bar

Figure 3-21: US Map Menu Bar

The *US Map* menu bar contains four options: **File, View, Map** and **Help.**

1. File Menu:

File > *Save as* **-** Saves the *US Map* as a .jpg image in a directory that you specify.

File > *Print* **-** Prints the active *US Map* on the monitor.

File > *Close* **-** Shuts down the US Map component.

2. View Menu:

View > *Rename Window…*- Displays the Rename Window dialog box and allows you to change the title bar name. Type in the desired name then press **OK** to change the title bar heading. Press **Cancel** to close the Rename Window dialog box without making any changes. (See Figure 3-22).

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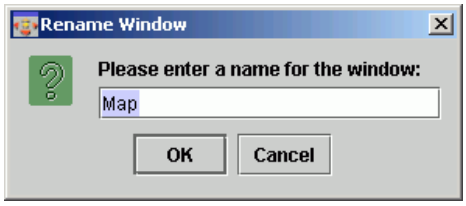

Figure 3-22: Rename Window Dialog Box

3. Map Menu:

Map > *Zoom In* – Allows the user to enlarge the Map.

Map > *Zoom Out* - Allows the user to reduce the Map size.

Map > *Default Zoom* – Returns the Map to the original default zoom.

4. Help Menu:

Help > *Map*- Accesses the web-based on-line help for the *US Map* component.

Query Manager Component

The *Query Manager* component can be viewed by pressing the **Show Query Manager** button (see Figure 3-23) or by selecting **Utilities** > *Query Manager* from the *Control Panel* Component. The *Query Manager* component enables you to query flights and create a Flight List that contains only flights that meet your selected criteria.

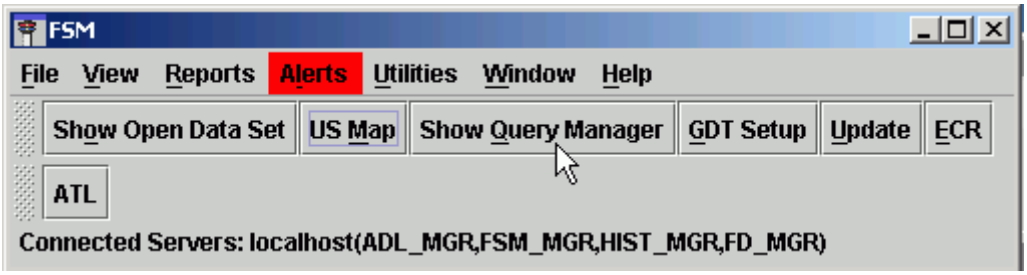

Figure 3-23: Opening Query Manager Component

The *Query Manager* component gives the user the option of selecting between *Built–in Filters* or *User-defined Filters* as shown in Figure 3-24.

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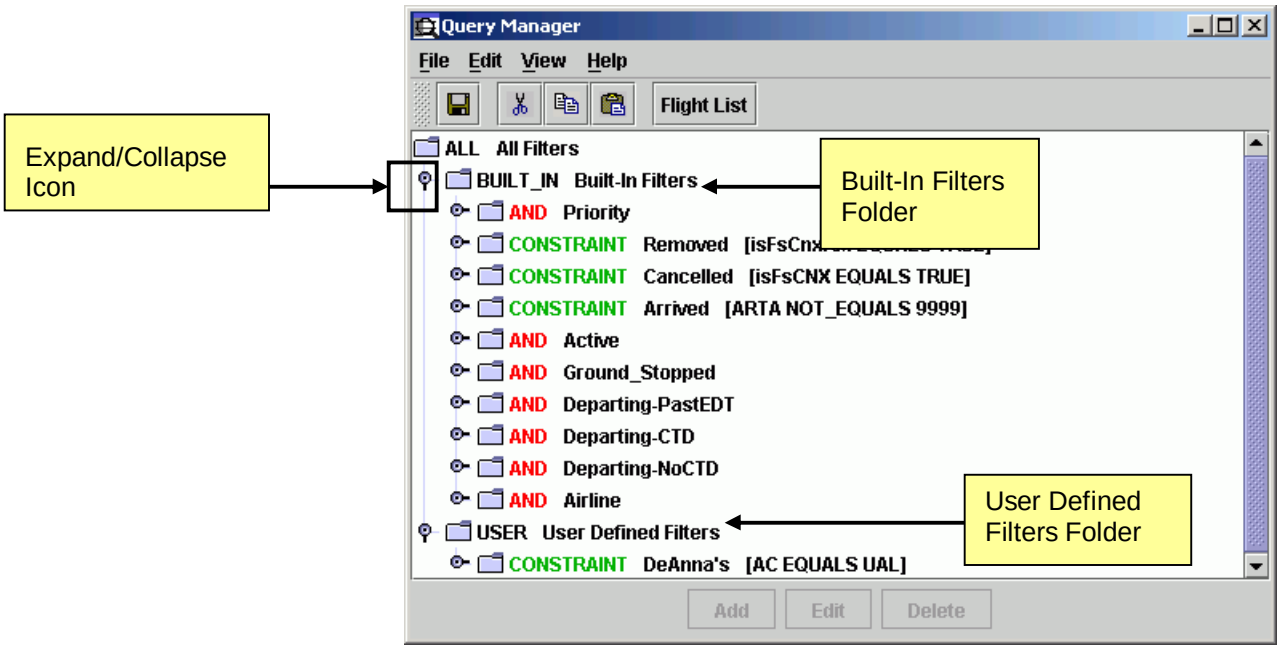

Figure 3-24: Query Manager Component

Query Filters

Built-in Filters

Built-in Filters are pre-defined, *read-only* filters designed from criteria that are frequently used for viewing flight information. Double-click on the BUILT_IN *Built-in Filters* folder or click on the Expand/Collapse icon to view/hide all contents in the folder. When the *Built-in Filters* folder is expanded you will see a number of filters to choose from. You may continue to drill down to view more detail by double-clicking on the folders or by clicking on their respective Expand/Collapse icons.

The ***AND*** filters list consists of filters that are compared together to find a match in the data set. For an object to match an ***AND*** filter, all the filters in the list must be true. An ***OR*** filter consists of a list of filters that are compared together to find matching flights in the data set. For an object to match an ***OR*** filter at least one of the filters in the list must be true. A ***CONSTRAINT*** is defined by an attribute, operator, or value. The red ***AND***, the blue ***OR*** and the green ***CONSTRAINTS*** coloring is used as a visual aide to distinguish between the three different types of filter options.

The ***AND***, ***OR,*** and ***CONSTRAINT*** filters have the ability to create new filters by copy/pasting a built-in filter selection directly into the *User Defined Filters* folder. The *Built-in Filters* option buttons remain grayed because they are read-only filters. A *Built-in Filter* cannot be edited or deleted for the same reason.

User Defined Filters

User Defined Filters are *active* filters created and customized based on your Flight List needs. There are two methods of creating user-defined filters:

1. **Creating a New Filter**
2. **Editing a Built-in filter**

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Creating a New filter

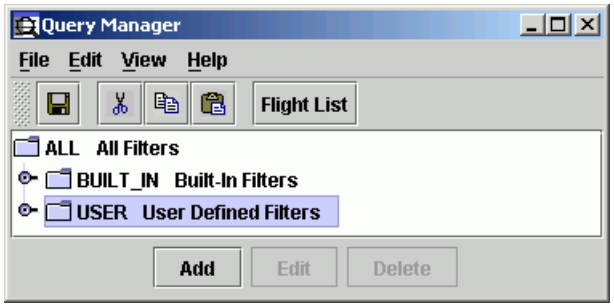

Figure 3-25: User Defined Filters

To create/build a new user defined filter, highlight the User Defined Folder as shown in Figure 3-25 and select the **Add** button. This will display the *Add Filter* dialog box, which lists three filter types to choose from: **OR List, AND List,** and **Constraint**. In the Filter name text field, you can name your filter. When the **AND List** filter type is selected, a new **AND** filter is added under the User Defined Filters folder. When the **OR List** filter type is selected, a new **OR** filter is added to the User Defined Filters folder as seen in Figure 3-26.

Figure 3-26: Add Filter Dialog Box

Once you have created a new **AND** or an **OR** filter, you can add additional filters and constraints to them. Use can also create a filter solely based on Constraint. User defined filters can be removed by highlighting the unwanted filter and then clicking the **Delete** button. The user can select the collapse/expand icon next to the filter name or double-click the folder to view/hide filter information. When the **Constraint** radio button is selected from the *Add filter* dialog box, the *Edit Constraint* window appears (see Figure 3-27).

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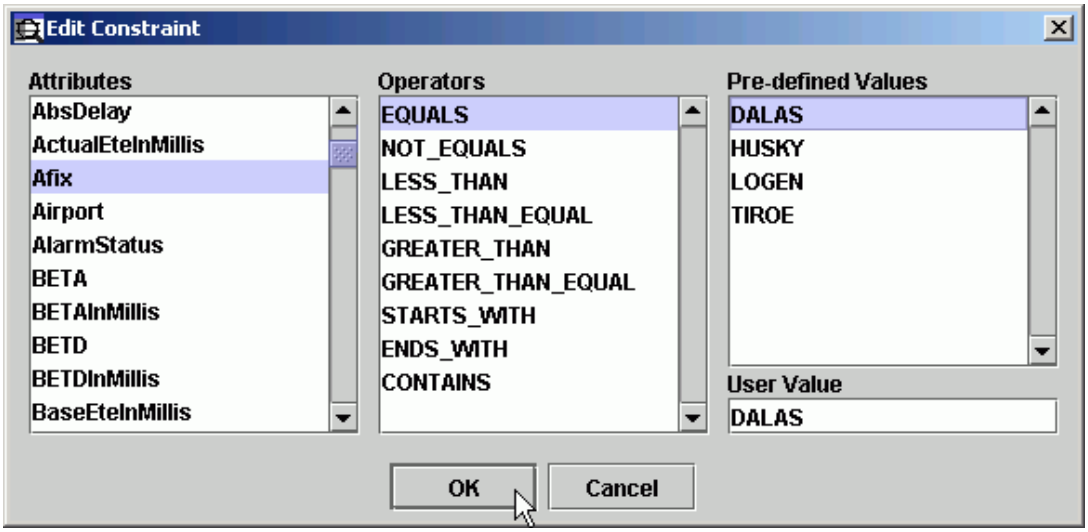

Figure 3-27: Edit Constraint Window

From the *Edit Constraint* window you must define your constraint by selecting a value from each of the three windowpanes (one value per window): Attributes, Operators and Pre-defined Values. First, select an Attribute in the left-most scroll box. This automatically populates the Operators windowpane with the available options based on your Attribute selection. Second, select one of the Operators listed. Some Pre-defined Values and User Values may automatically populate as a result of the selection made in the Attributes windowpane. Third, select a Pre-defined Value or if there aren't any options available in the Pre-defined Value windowpane you must type a value in the User Value text-field. Once your Constraint definition has been completely, press **OK** and the new **CONSTRAINT** filter is added under the User Defined Filters. The **CONSTRAINT** appears with the new filter name including the three values chosen from the Edit Constraints component in brackets. To edit an existing **CONSTRAINT**, click **Edit** to display the *Edit Constraint* window again. You can select the collapse/expand icon next to the Constraint filter name or double-click on the folder to view more details on the defined constraint as shown in Figure 3-28.

> **Note:** User-defined Constraints can only be edited; additional filters cannot be amended to an existing CONSTRAINT. The **Add** button will be grayed-out when a CONSTRAINT is highlighted.

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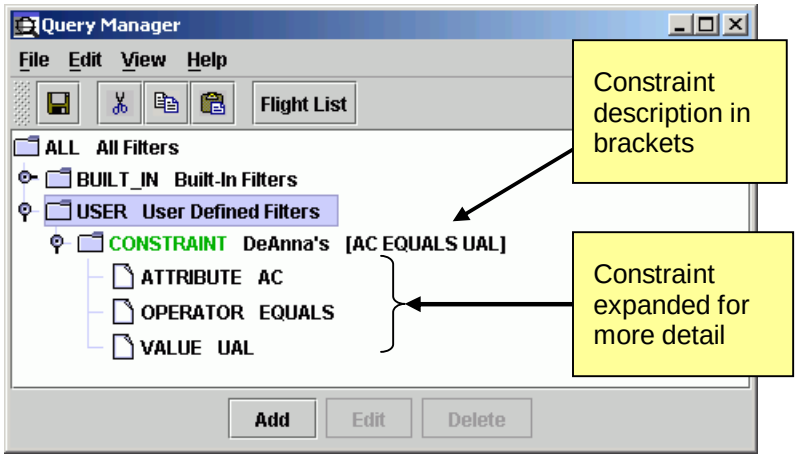

Figure 3-28: User Constraint Added

Edit an Existing Built-in Filter

The second method to create a User-defined Filter is to edit an existing built-in filter. Select the filter from the Built-In Filters that you want to edit then ***cut*** the filter by using **Edit** > *Cut*, CTRL + X on the keyboard or the scissors button. Next, highlight the User Defined Filter folder and paste the built-in filter by using **Edit** > *Paste*, CTRL + P, or the Copy button. From the User Defined Filters folder, you can edit the filter to fit the needs of the TMI. Any **CONSTRAINT** within the User Defined Filter folder can be edited using the same method described above in Creating a New Filter. Just highlight the constraint you want to change, then press **Edit** to display the *Edit Constraint* window.

> **Note:** *User Defined Filters* cannot be copied and pasted into *Built-in Filters.*

Opening a Flight List

You must be monitoring an airport before you can query for a Flight List. Open the *Query Manager* Component by pressing the **Show Query Manager** button, by or selecting **Utilities** > *Query Manager* from the Control Panel. Within the Show Query Manager window, select any one of the *Built-in or User-Defined Filters*, then select the Flight List button.. If you are only monitored one airpot the Flight List automatically opnes, in table format, with the information generated from the selected filter criteria. "No Active Data Sets" error messages will pop-up if no airport is being monitored by the FSM Client. If you are monitoring more than one airport, pressing the Flight List button will display the Set Data Set window. Select the desired airport you wish to view the queried flight list and press ok to open the Flight List (see Figure 3-29). See Chapter 6: Flight List for detailed information on Flight Lists.

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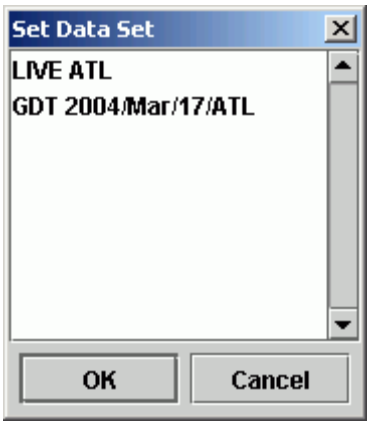

Figure 3-29: Set Data Set Window

Query Manager Menu Bar

Figure 3-30: Query Manager Menu Bar

The menu bar of the FSM *Query Manager* component contains four options: **File, Edit, View**, and **Help**.

1. **File Menu**

File > *Save* - Saves the User-Defined Filters into the user_filter.ini file. In the FSM Client ini file, you can specify the name and location of where the user_filter.ini file is stored. The saved filters are available every time you open a Query Manager.

File > *Close* – Closes the Query Manager window - taking no action.

2. **Edit Menu**

Edit > *Cut*– Deletes selected User Defined Filters from the Query Manager.

Edit > *Copy* Copies selected filters to the clipboard.

Edit > *Paste*– Pastes selected filters from the clipboard to the User-Defined Filters folder.

3. **View Menu**

View > *Rename Window…* - Displays the Rename Window dialog box and allows you to change the component name in the title bar. Enter the desired component name then press **OK** to change the title bar heading. Press **Cancel** to close the Rename Window dialog box without making any changes. (See Figure 3-32).

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Figure 3-31: Rename Window Dialog Box

View > *Flight List* - Displays the Flight list if only one airport is monitored by the client, or the Set Data Set window when multiple airports are being monitored.

4. **Help Menu**

Help > *Query Manager* – Accessed the web-based on-line help for the *Query Manager Component*.

Bar Graph Component

The *Bar Graph* component allows you to view the overall demand of the airport being monitored. Airport demand consists of the total flights using the airport for arrivals and departures. The FSM Dynamic Graph displays airport demand information as it's received through ADLs. There are 12 different color options to view this demand. The Arrival Status Tab is the default view when the *Bar Graph* component is first opened. The airport, date, last ADL update time, and data mode is also displayed in the Bar Graph title bar.

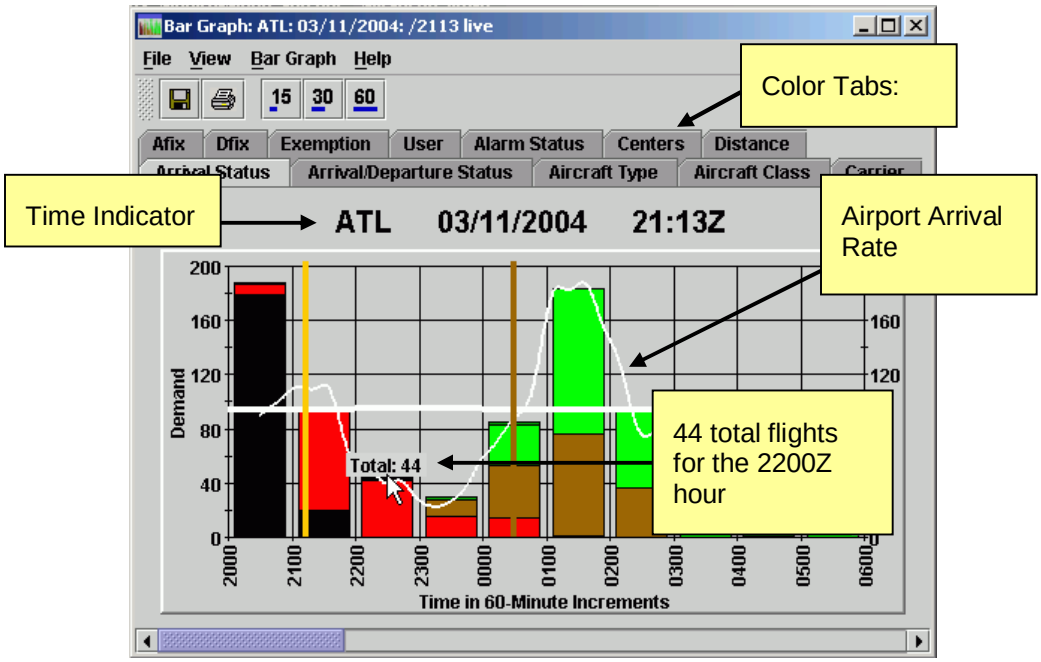

Figure 3-32: Bar Graph Component

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The *Bar Graph* component displays data according to the "Color" tab option currently selected. For example, the default color tab selected is Arrival Status, which displays the bars in the graph colored according to the percentage of flights that represent each respective arrival status. If half of the flights for one time period are scheduled to depart, while the other half are airborne (flight active), the bar for that hour will be half red (flight active) and half lime green (departing [No EDCT]). If every flight for the hour has arrived, the bar for that hour will be black. The graph is dynamic and changes according to the information from each ADL update. Likewise, the graph automatically updates itself when you choose a different "Color" Tab. To view a flight count for any hour, roll the mouse over any bar within the *Bar Graph*, the respective number/count will appear for the bar the mouse is hovering over. If you roll the mouse near the top of a bar, the total number of flights for that hour will appear. The same method can be used to find out what the Airport Arrival Rate (AAR) is. Roll the mouse over the AAR and the rate will appear. Double clicking any bar will display a Flight List for flights contained in that hour bar. See Chapter 6: Flight List for more detailed information on viewing Flight List information

To view the color legend check/uncheck the **View** > *Show Legend* checkbox from *the Bar Graph's* main menu or press CTRL + L on the keyboard. The Legend displays the color scheme for the color tab currently displayed and allows you to toggle the coloring options on/off by using the checkbox next to each color. Clicking **Synchronize Legend** from the legend gives you a drop down box to select other opened component(s) (see Figure 3-33). Selecting a checkbox next to any other components will dynamically synchronize the current component with the selected component from the drop-down menu.

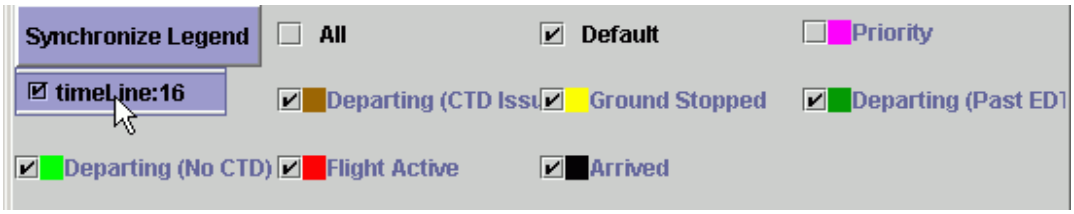

Figure 3-33: Synchronize Legend

> **Note:** Figure 3-33 is a good example of why you may want to rename your component Windows when monitoring several airports. Instead of time line: 16, renaming the *Time Line* component to ATL *Time Line* would make component identification easier. Use **View** > *Rename Window…*when available to rename the title bars.

Bar Graph Menu Bar

Figure 3-34: Bar Graph Menu Bar

The menu bar of the FSM Bar Graph component contains four options: **File, View, Bar Graph** and **Help** as shown above in Figure 3-34.

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Shortcut Keys

15, 30, and 60 – Selecting 15, 30, or 60-minutes time-bin buttons displays bar graph capacity and demand information based pm the time bin value selected. The default time increment is 60-minutes.

1. **File Menu**:

File > *Save as* - Saves the *Bar Graph* as a .jpg image to a directory you specify.

File > *Print* - Prints the *Bar Graph* currently viewed on your screen.

File > *Close Data Set* – Closes all the components associated with the open component. This function will remove the airport button from the Control Panel for the selection airport and data mode.

File > *Close* - Shuts down the *Bar Graph* component for that particular airport.

2. **View Menu:**

The **View** Menu consists of 12 checkboxes. Check the box to view the information and uncheck the box to hide the information.

View > *Rename Window* - Displays the Rename Window dialog box that allows you to change the component name of the title bar. Enter the desired component name then press **OK** to change the title bar heading. Press **Cancel** to close the Rename Window dialog box without making any changes.

View > *Arrival Data* - Displays all arrival data for the monitored airport. Only when you are viewing arrival data in FSM, will the bars of the graph will be solid.

View > *Departure Data* - Displays all departure data for the monitored airport. Only when you are viewing departure data in FSM, the bars of the graph will be hashed as shown in Figure 3-35. When you are viewing both arrival and departure data in FSM, you will see two bars for each time increment. Bars that represent arrival data will be solid, whereas bars that represent departure data will be hashed.

View > *Stack Departures* - To view departing flights in the same bars as arriving flights, select the checkbox next to Stack Departures on the graph to check it. (See Figure 3-36). The bars on the graph will become solid, with both arriving and departing flights included in the bar for their departure or arrival time. To differentiate between departing and arriving flights, you will want to use the Arrival/Departure tab option to color your flights. Using Arrival/ Departure will display (by default) arriving flights in green and departing flights in blue.

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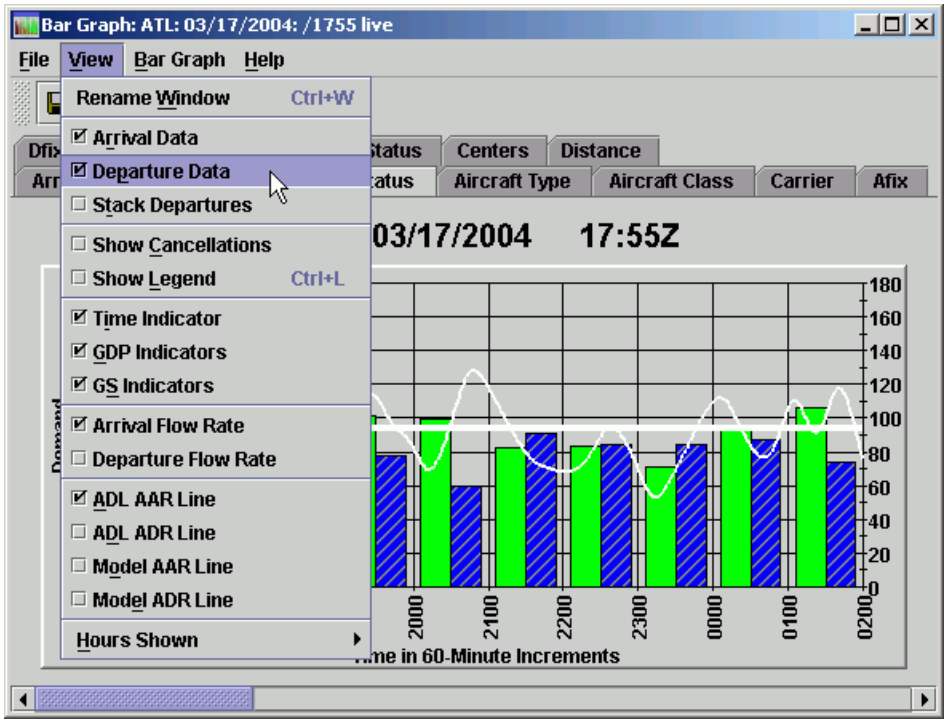

Figure 3-35: Normal View with Arrival and Departure Data Displayed

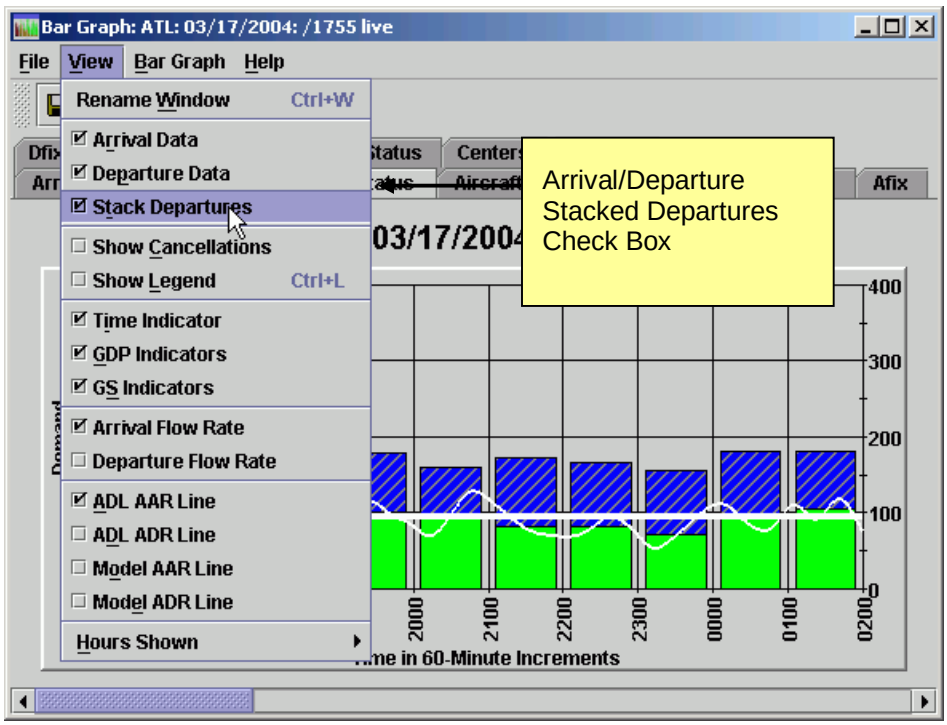

Figure 3-36: Arrival and Departure Data displayed in stacked format

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View > *Show Cancellations* – Displays cancelled flight in the color cyan. Cancelled flights do not automatically appear in the graph. To show cancelled flights in the graph, select the *Show Cancellations* checkbox. Showing cancelled flights is useful to compare the original airport demand with the demand after the cancellations. To differentiate between cancelled and regular flights, you will want to use the Arrival Status Tab option to color your flights. This will force cancelled flights, (displayed by default in cyan). To hide cancelled flights, uncheck the box next to *Show Cancellations.*

View > *Show Legend* or Ctrl + L on the keyboard - Displays the appropriate color legend associated with the tab option you are currently viewing.

View > *Time Indicator* – Like the FSM Time Line, the Bar Graph Component also tracks time. The Time Indicator is an orange vertical line that remains fixed at the current time. To show or hide the time indicator, select **View** > *Time Indicator* to check the option on or off.

View > *GDP Indicators* – Displays brown vertical lines to indicate the start time and end time of a current Ground Delay Program. The program time indicators appear automatically when a program goes into effect at the monitored airport. To turn the indicators off, under **View** > *GDP Indicators,* uncheck this checkbox. When the GDP Indicators is checked, the program time indicators will appear in the graph. When the option is not checked, the program time indicators will not appear.

View > *GS Indicators* - Displays yellow vertical lines to indicate the start time and end time of a current Ground Stop. The Ground Stop time indicators appear automatically when a Ground Stop goes into effect at the monitored airport. To turn the indicators off, under **View** > *GS Indicators,* uncheck this checkbox. When the GS Indicators is checked, the program time indicators will appear in the graph. When the option is not checked, the program time indicators will not appear.

View > *Arrival Flow Rate* – Displays a thin, white line that represents the arrival flow rate independently of the time-bin convention, enabling you to visualize arrivals as a dynamic flow rate.

View > *Departure Flow Rate* – Displays a thin, cyan line that represents the departure flow rate independently of the time-bin convention, enabling you to visualize departures as a dynamic flow rate.

View > *ADL AAR Line* – Displays a white horizontal line that runs through the graph representing the current Airport Arrival Rate (AAR) for the monitored airport. The ADL AAR (shown by default) is a fixed AAR sent by the FAA Air Traffic Control System Command Center to advise of the number of arriving aircraft an airport can accommodate at any given interval of time. The AAR changes according to the interval of time being displayed. For example, an AAR of 60 per hour = AAR of 15 per quarter hour. Only ATCSCC users can change the ADL AAR.

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View > *ADL ADR Line* – Displays a cyan horizontal line that runs through the graph that represents the Airport Departure Rate (ADR) for the monitored airport. The ADL ADR, (shown by default) when **Departures** is checked, is a fixed value sent by the FAA Air Traffic Control System Command Center to specify the number of departing aircraft an airport can accommodate at any given interval of time. The ADR also changes according to the time increment used in the graph display. For example, an ADR of 60 per hour is equal to an ADR of 15 every quarter hour.

View > *Model AAR Line* – Displays a user-specified AAR as a dashed white line. You use the Model AAR for modeling and analysis; this is changeable according to program needs.

View > *Model ADR Line* or CTRL + 0 on the keyboard - Displays a dashed blue line and is useful for modeling traffic scenarios and analysis.

View > *Hours Shown* > 2/3/4/5/6/8/10/12/14/16/18/20 Hours - Dragging your mouse on the *Hours Shown* option will create a secondary popup menu with 12 different radio button options: 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, and 20 hours. The default data display is 10 hours. You can specify the number of hours displayed in the bar graph to see more or less flight data. For example, you may want to view the AAR in 15-minute increments, which is difficult to see on a graph with 10 hours' worth of data. To change the number of hours in the graph, select **View** > *Hours Shown* > *X Hours* (X = number of hours). The graph automatically updates to show the amount of hours specified.

3. **Bar Graph Menu:**

Bar Graph > *Track Time* - Makes the graph actually move as the time changes. When you choose to track time in this way, the second bar on the graph will always be the current time. Select the checkbox **Bar Graph** > *Track Time*. When the box is checked, the bars will move with the current time. When the box is not checked, the bars will not move, but the Time Indicator can still be used to show the current time on the graph.

Bar Graph > *Set Time* – This option is functional only while in Historical mode.

Bar Graph > *Model Arrival Rates* > *Specify* – When **View** > *Model AAR Line* is selected; a dashed white line will appear in the bar graph at the same position as the ADL AAR. If the ADL AAR is displayed on the graph, the dashed line (for modeling) is hidden behind the solid white ADL line. To specify the Model AAR there are two methods:

- The AAR on the graph can be changed by selecting **Bar Graph** > *Model Arrival Rates* > *Specify*. This option will display the **Specify Model AAR** window. Fill in the necessary information and the new AAR will be displayed on the graph. See Chapter 7 for more information on changing the AAR. You may access the same Model AAR feature by selecting **Utilities** > *Model Arrival Rates* on the Control Panel. See also Chapter 9.
- Likewise, you can drag the white line in the graph to the desired AAR. The dashed line will move to the AAR specified. Note that only the

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portion of the line to the right of the cursor will move. Any portion of the line to the left of your cursor should remain in the same position as you drag the line to a new AAR.

Bar Graph > *Model Arrival Rates* > *Reset* – Restores the Model AAR to its original value. The Model AAR will disappear.

Bar Graph > *Model Departure Rates* > *Specify* – When **View** > *Model ADR Line* is selected; a dashed blue line will appear in the bar graph in the same position as the ADL ADR. If the ADL ADR is displayed on the graph, the dashed line (for modeling) is hidden behind the solid blue line. To specify the Model ADR there are two methods:

- The ADR on the graph can be changed by selecting **Bar Graph** > *Model Departure Rates* > *Specify*. This option will display the **Specify Model ADR** window. Fill in the necessary information and the new ADR will be displayed on the graph. See Chapter 7 for more information on changing the ADR. You can access the same Model ADR feature by selecting **Utilities** > *Model Departure Rates* from the *Control Panel*.
- Likewise you can drag the blue line in the graph to the desired ADR. The dashed line will move to the ADR specified. Note that only the portion of the line to the right of the cursor will move. Any portion of the line to the left of your cursor should remain in the same position as you drag the line to a new ADR.

Bar Graph > *Model Departure Rates* > *Reset* – Restores the Model ADR to its original value. The Model ADR will disappear.

Note: Modeling the AAR or ADR rates from the Bar Graph will only change the local model rate for modeling purposes. To send a new AAR/ADR to ETMS, without issuing a TMI, use **Demand Rates** > *Modify AAR/ADR* from the Main Control Panel and click **Send.**

4. **Help Menu:**

Help > *Bar Graph* – Accesses the web-based on-line help for the *Bar Graph* component.

Bar Graph Tab Options

The 12 tabs are dynamically arranged in the *Bar Graph* based on the screen resolution. You have the option to color flights according to several variables available in FSM. The default tab setting is to color flights according to their Arrival Status; however FSM offers the flexibility to view flights according to different criteria. This allows for effective analysis of which flights make up the demand at an airport. Each of the 12 pre-defined Color tabs of the *Bar Graph* window displays different information with a corresponding color scheme and legend. See Table 3-2 below of the default color settings for all 12 tabs.

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Table 3-2: Bar Graph Coloring Tabs

Tab Option	Bar Color	Description
Arrival Status (Default View):	Light Green	Departing (No CTD)
	Red	Flight Active
	Black	Arrived
	Brown	Departing (EDCT Issued)
	Dark Green	Departing (Past EDT)
	Yellow	Ground Stopped
	Cyan (optional)	Cancelled
	Blue (optional)	Removed
	Pink (optional)	Priority
Arrival/Departures	Light Green	Arriving
	Blue	Departing
Aircraft Type	Light Green	Turbo
	Red	Jet
	Black	Propeller
	Yellow	Unknown
Aircraft Class	Light Green	Large
	Red	Heavy
	Black	Small
	Yellow	Unknown
Carrier	Various Colors	All Majors
	White	Single Airline (User input)
AFIX	Various Colors	The Arrival Fixes associated with the monitored airport
DFIX	Various Colors	The Departure Fixes associated with the monitored airport
Exemption	Red	Flights Exempted

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Tab Option	Bar Color	Description
	Black	Flight Excluded
	Light Green	Flight Not Exempted
User	Blue	Air Cargo
	Magenta	Carrier
	Light Green	General Aviation
	Brown	Military
	Orange	Air Taxi
	Cyan	Other
	Red	Unknown
Alarm Status	Red	Flights With Alarm
	Black	Other Flights
Centers	Red	All Centers
Distance	Red	All Distances

Time Line Component

The *Time Line* component is a timetable that displays airport arrival and departure rates and demand in one-minute hash marked increments in the hour columns. The number of hours displayed is dynamically based on the size of your *Time Line* component. The number of hours viewed on the screen at one time can be changed by dragging the edge of the window in or out to increase/decrease the window size. Scroll bars are also available to scroll forward or backwards in time. From the *Time Line*, you can view flights arriving and departing from a monitored airport, as well as open arrival slots and cancellations. The airport, date, last ADL time, and data mode are displayed in the *Time Line* title bar. In addition, directly above the coloring tabs, the *Time Line* displays the airport being monitored, the date, and the time.

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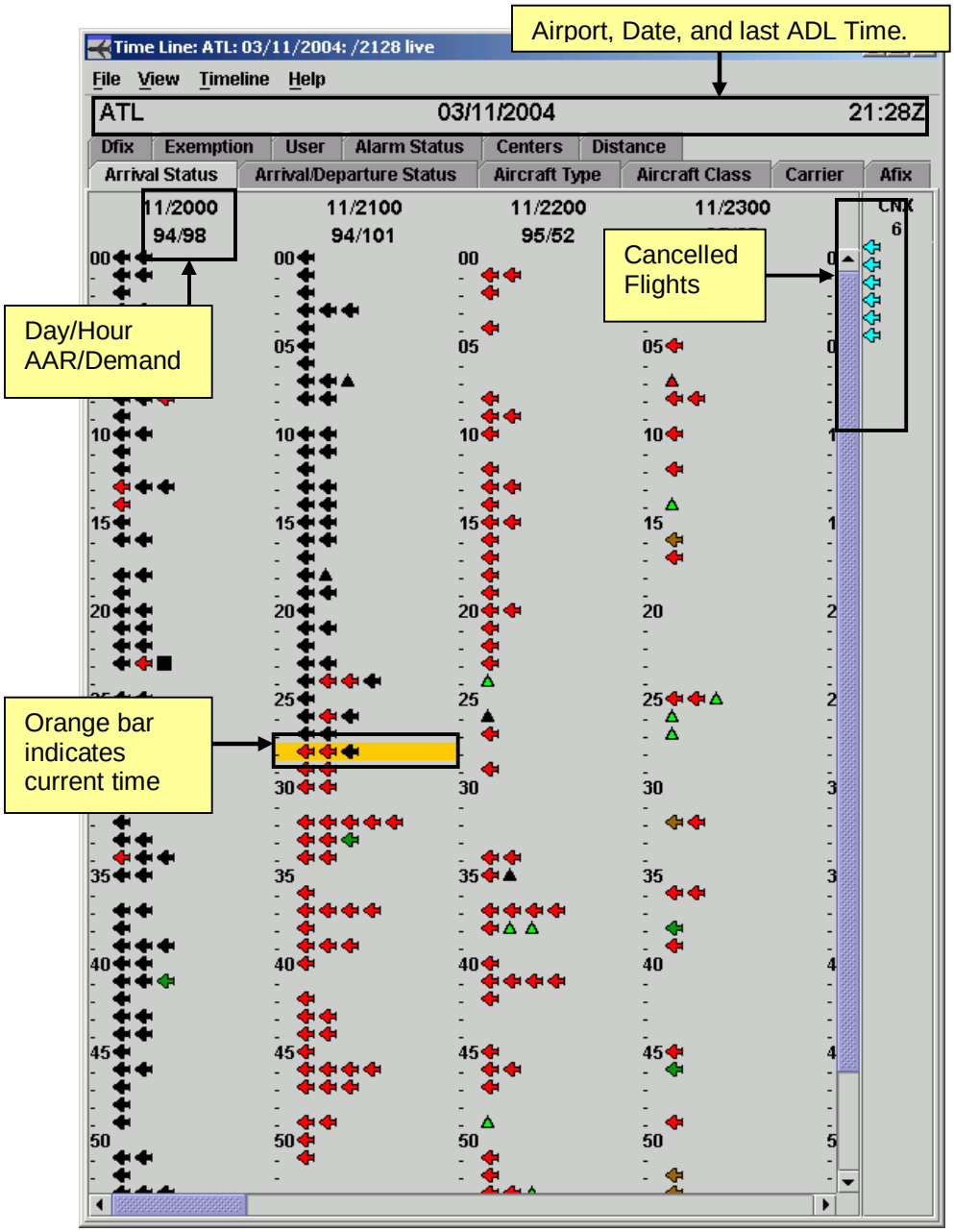

Figure 3-37: Time Line Component

The *Time Line* component displays information in hour-columns with hash marks that represent each minute in the hour as seen in Figure 3-37. The large numbers at the top of each column represent the date/hour (i.e. 27/1600 indicates that you are looking at the 1600 hour for the 27th day of the month). Directly below the date/hour information is the AAR and/or ADR versus the demand at the airport (the number of flights projected to arrive) for the hour you are viewing. For example 70/65 at the top of a column indicates that the Airport Arrival Rate is 70 for that hour and 65 flights are expected to arrive within that hour. The Airport Departure Rate versus demand is shown in parentheses when departure data is displayed. For example (60/40) indicates that 60 flights can depart

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the airport in that hour, but only 40 are projected to depart. The last data update time is highlighted in orange on the *Time Line*.

Each flight arriving at the monitored airport is shown to the left of the minute hash marks, which corresponds to the ETA of the flight. By hovering your mouse over a flight, a pop-up window will display the flight's ACID, Departure airport, arrival airport, ETD, and ETA (see Figure 3-38).

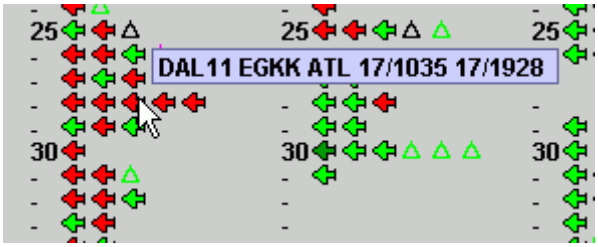

Figure 3-38: Pop-up Flight information

Right clicking on a flight icon will give you four additional options for that flight: *View flight info, View flight details, EDCT Check, EDCT Update, and ECR.*. Selecting *View flight info* displays the Flight Info panel, which contains general ADL information for a flight, including ADIC, status, origin airport, destination airport, ETD, ETE, ETA, CTD, CTA, Delay Flag, and Cancel Flag when applicable. To view more detailed flight information, select the *View flight details* option. The Flight Details window contains all the ADL information for that flight. *EDCT Check* opens the EDCT Check dialog box giving ATCSCC specialists the ability to send a message to the Hubsite requesting the flight's EDCT time as opposed to getting the ECDT time from the ADL. The *EDCT Update* option opens the EDCT Command Line dialog box, which allows ATCSCC specialists to send an EDCT update request to the Hubsite. Selecting the ECR option from the Time Line will open the ECR component for the selected flight. Opening ECR in this manner will automatically fill the ACID, ORIG, and flight information in the ECR component for the flight.

Note: EDCT Check and EDCT Update are ATCSCC only options.

Cancelled flights are displayed under the CNX column and have the same hover and right-click capabilities as all other flights. FSM keeps and displays flight data compiled by Volpe National Transportation Systems Center, which includes data for up to 20 hours after the current time.

From the *Time Line* component, flight lists and flight counts are also accessible. To retrieve a Flight List for a particular group of flights, click on the minute you want to start your flight list and a box will appear around the flights in the minute you just selected. Then press ALT + the minute you want to be at the end of your flight list. These actions automatically give you a flight list for the group of flights you have just selected. To get a flight count list with its equivalent AAR, do the same actions as listed above for getting a flight list, but press CTRL rather than ALT. This will give you the flight count for the selected group of flights (see Figure 3-39).

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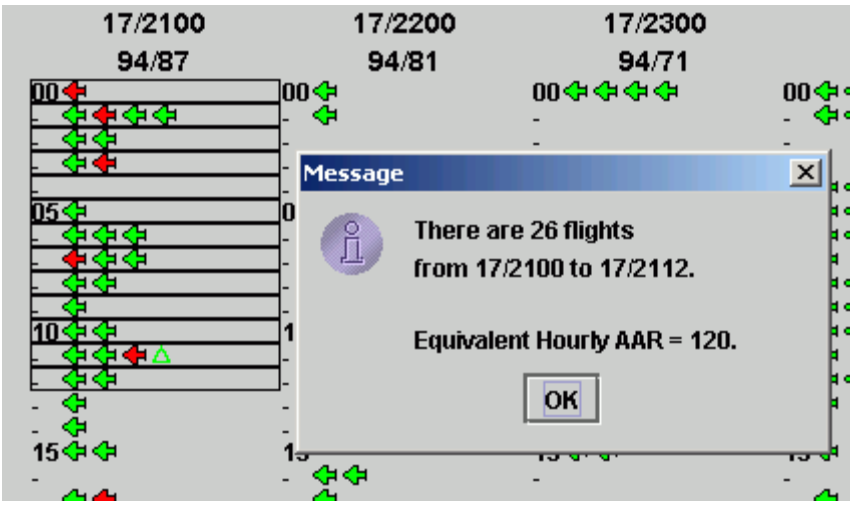

Figure 3-39: Flight Count

Icons in the Time Line

- *Airplane Icons* represent flights arriving at or departing from the monitored airport. Arriving flights face to the left while departing flights face right. Clicking an arrival flight icon highlights it, putting a white square around the icon. If the flight has been delayed, the open arrival slot that resulted from its delay will also be highlighted.
- A *filled square icon* will only appear when a GDP is in effect. The filled square represents an arrival slot left open by a cancelled flight. The arrival slot is open and available for use by other flights. Cancelled flights are displayed on the Time Line under the CNX heading and will be highlighted when their associated slot is selected.
- An *empty square icon* also corresponds to a cancelled flight. However, this arrival slot is not available for use by other flights. Clicking this icon will highlight its associated cancelled flight, displayed under CNX in the Time Line.
- A *filled triangle icon* will only appear when a GDP is in effect. The filled triangle indicates an open arrival slot due to a delayed flight. The arrival slot has been left open and is available for use by other flights. Clicking this icon will also highlight the delayed flight that caused the slot to open up.
- An *empty triangle icon* also corresponds to a delayed flight. However, this arrival slot is not available for use by other flights. Clicking this icon will also highlight the associated delayed flight.

Note: You can find an explanation for any of the *Time Line* icons by using **Help > Legend** in the FSM main Control Panel component.

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Table 3-3: Time Line Icons

Time Line Icon	Description
	Indicated the latest or current ADL file data update time in the Time Line component.
	A flight arriving at the monitored airport by ETA in the Time Line component and colored by the current color scheme.
	A flight departed from the monitored airport by ETD in the Time Line component and colored by the current color scheme.
	An open slot due to a cancelled flight, which is included in a GDP. It is positioned at its arrival slot time and is colored by carrier.
	An open slot due to a cancelled flight, which is not included in a GDP. It is positioned at its (IGTA-taxi) and colored by carrier.
	An open slot due to a delayed flight that is included in the GDP. It is positioned at its arrival slot time and colored by carrier. The corresponding flight is positioned at a later time matching the ETA.
	An open slot due to a delayed flight that is not included in the GDP. It is positioned at its (IGTA – taxi) and colored by carrier. The corresponding flight is positioned at a later time matching the ETA

Figure 3-40: Time Line Icons

Time Line Menu Bar

Figure 3-41: Time Line Menu Bar

The menu bar in the FSM *Time Line* component contains four options: **File, View, Time Line** and **Help**.

1. **File Menu:**

File > *Save as* - Saves the *Time Line* as a .jpg image in a directory that you specify.

File > *Print* - Prints the *Time Line* that is currently on the screen.

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File > *Close Data Set* – Closes all the components associated with the open component. This function will remove the airport button from the Control Panel for the selection airport and data mode.

File > *Close* - Shuts down the *Time Line* component for that particular airport.

2. **View Menu:**

View > *Rename Window…*- Displays the Rename Window dialog box and allows you to change the component name in the title bar. Enter the desired name then press **OK** to change the title bar heading. Press **Cancel** to close the Rename Window dialog box without making any changes.

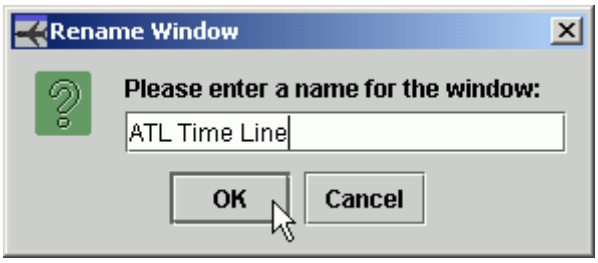

Figure 3-42: Rename Window

There are six additional display options to choose from under the **View** menu. To select the information, the checkbox must be selected.

View > *Arrival Data* - Displays all arrival data for that airport.

View > *Departure Data* - Displays all departure data for that airport.

View > *Show Cancellations* - Displays all cancelled flights under the column marked CNX, to the right of the active flight information.

View > *Show Color Legend* - Displays the appropriate color legend associated with the current view.

View > *Open Slots in Carrier Color* - Displays all open slots due to cancelled or delayed flights in the associated carriers color.

View > *Auto Icons* - Displays the flights in the TSD icon format. The TSD format displays different icons based on the flight aircraft weight. When *Auto Icons* is unchecked, the classic FSM *Time Line* icons are displayed, which display the same icon for all aircraft weights.

Table 3-4: Auto Icons

Classic View	New (TSD) Icon Format	Description
		Jet
		Heavy
		Prop (Includes Turbo and Piston)

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View > *Flight Info* - Displays the Flight Info window for a quick reference on the flight.

View > *Flight Details* - Displays the Flight Details window for more in depth information on the flight.

View > *Flight List* - Displays the FSM Flight List.

Note: View > *Arrival Data*, *Show Cancellations*, and *Open Slots in Carrier Color* checkboxes are selected by default.

3. **Timeline Menu**:

Timeline > *Track Time* –Allows you to turn *Track Time* on/off by checking/un-checking the *Track Time* checkbox. To force the *Time Line* component to update when the current hour changes, place a checkmark in the *Track Time* box under the Time Line. When the hour changes, the Time Line will move forward one hour. If the *Track Time* box is unchecked, you can scroll forward or back in time and at the next update time the Time Line will not return to the current time.

Timeline > *Set Time* – This option is only an available under Historical Data Mode and allows you to choose the time to view within a set of historical data.

Timeline > *Search Flight by Call Sign* - Allows you to find a particular flight by entering the flight's call sign and original airport. The flight icon in the *Time Line* is highlighted with a white box.

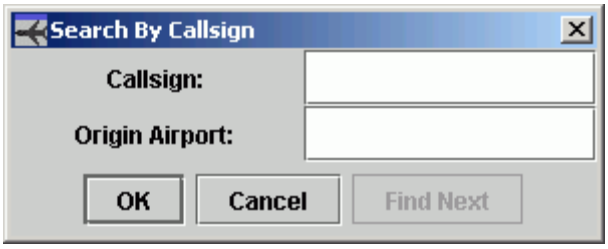

Figure 3-43: Search By Call Sign

4. **Help Menu:**

Help > *Time Line* - Accesses the web-based on-line help for the *Time Line* component.

Help > *Legend* – Accesses the web-based on-line help for the *Time Line* icon legend.

Time Line Color Tab Options

Figure 3-44: Time Line Coloring Tabs

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The 12 tabs are dynamically arranged in the *Time Line* based on the screen resolution. The picture above is based on Windows default settings. You have the option to color flights according to several variables available in FSM. The default value colors the flights according to their arrival status; FSM gives you the flexibility to view flights according to different criteria. This allows for effective analysis to determine which flights make up the demand at an airport. There are 12 pre-defined Color tabs in the *Time Line* component. Each color tab-option displays different information with a corresponding color scheme and legend (see Table 3-5).

Table 3-5: Color Tab Options

Tab Option	Color Display Options
Arrival Status (Default View):	Priority, Removed, Departing (CTD Issued), Ground Stopped, Departing (Past EDT), Departing (No CTD), Flight Active, and Arrived Flights
Arrival/Departure Status:	Arriving and Departing Flights
Aircraft Type	Propeller, Turbo, Jet, and Unknown
Aircraft Class	Small, Large, Heavy, and Unknown
Carrier	All Major carrier and option to enter a single carrier
Afix	Color by arrival fix for that airport
Dfix	Color by departure fix for that airport
Exemption	Flts Excluded, Flts Not Exempted, and Flts Exempted
User	Air Cargo, Carrier, G/A, Military, Air Taxi, Other, and Unknown
Alarm Status	Flights with Alarm Set and Other flights
Centers	ZAB, ZAU, ZBW, ZDC, ZDV, ZFW, ZHU, ZID, ZJX, ZKC, ZLA, ZLC, ZMA, ZME, ZMP, ZNY, ZOA, ZOB, ZSE, ZTL, ZZZ and manual input. **Note:** Center options may change for Canadian airports.
Distance	Distance ranges from <200 to <2400 in increments of 200 miles and >=2400.

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4 Ground Delay Tools Components

Ground Delay Tool (GDT) Components aid users in looking at various operational or traffic scenarios. You can use modeling tools to analyze existing operations and previous days' events. The actual running and issuing of Traffic Management Initiatives is not covered in this chapter. This chapter familiarizes you with all the GDT components:

1. GDT Setup
2. GDT Map
3. GDT Demand Graph
4. GDT Data Graph
5. GDT Data Table (Optional)
6. GDT Time Line (Optional)

You can open any monitored airport in Ground Delay Tools (GDT) mode by choosing a monitored airport and then selecting the **GDT Setup** button from the main *Control Panel* component. There are four default GDT components that will automatically display the airport selected. All GDT components are interactive with one another; any change in one component will dynamically be reflected in all other components where applicable.

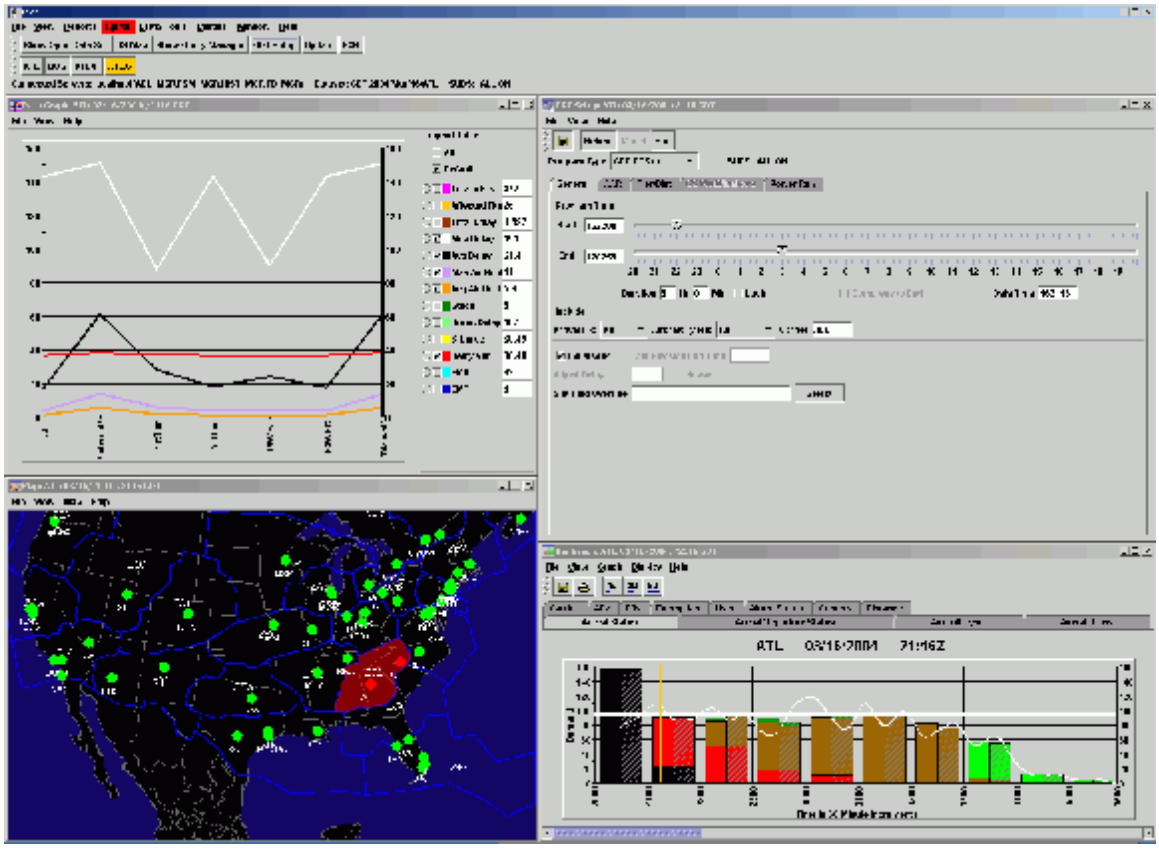

Figure 4-1: GDT Default Components

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GDT Setup Component

The *GDT Setup* component is used to issue and send Traffic Management Initiatives (TMIs). The *GDT Setup* component consists of a menu bar, four action buttons, Program Type selection box, and five tabs that focus on different areas of information. You must select the type of TMI you wish to issue from the **Program Type** selection box:

1. **GDP RBS++** - The default Program Type. This program runs the Ration By Schedule Algorithm plus Compression.
2. **GDP RBS –** The original Ration By Schedule Algorithm. RBS is based on IGTA wheel arrival time (IGTA – Taxi).
3. **Compression** – The program is run to decrease delay on flights already involved in an existing GDP. If there are a number of slots for canceled flights in the stack hours, compression can be used to move these flights to a later slot without needing to extend the GDP.
7. **GS Immediate** - Unlike ground delay programs, which delay flights because of a reduced AAR, the Ground Stop function prevents flights from departing until further notice. GS Immediate issues a Ground Stop Immediately.
4. **GS Future** - Similar to GS Immediate, although the Ground Stop is issued at a specified time in the future.
8. **Blanket** – This Program type can be used to revise any ground delay operation. This option is used to add or subtract a fixed number of minutes to or from FAA-imposed delay. Blanket is not to be used in conjunction with a GS.
9. **Airborne Holding** - Used by traffic management specialists to determine the necessity of a GDP. In certain situations, putting delay on flights en route may be a better option than delaying flights on the ground. The airborne holding algorithm in FSM produces the amount of expected airborne holding delay, defined as [ASLOT – ETA] that would result from running a program.
5. **Purge** - Cancels a GDP or GS, releasing all delay on included flights. This Program type requires no input on any Tab option.

The *GDP Setup* component tab options and features will change based on the Program Type selection. The five *GDT Setup* Tabs are General (default selection), AAR, Tier/Distance, GS Modifications, and Power Run. The three action buttons are **Reload**, **Model**, and **Run**. These buttons are active when the feature is available. After any modification has been made to any portion of the *GDT Setup* component, which is visually indicated by the Tab window area highlighted with a red border, the **Model** button becomes active. Pressing **Model** will model and reflect your changes in all GDT components for analysis and review. After pressing **Model**, your *GDT Setup* component will also be reset and the red border will disappear until an additional change is made. **Run** will display the GDP/GS coversheet, which then gives you the option to send and **Advisory** or **Autosend** this initiative to ETMS. This section will encompass the Setup Panel based on each Tab Option. Closing the *GDP Setup* component closes all the GDT components the airport. The GDT Setup panel displays the substitution status for the airport: SUBS: ALL ON, ALL OFF, or SCS OFF.

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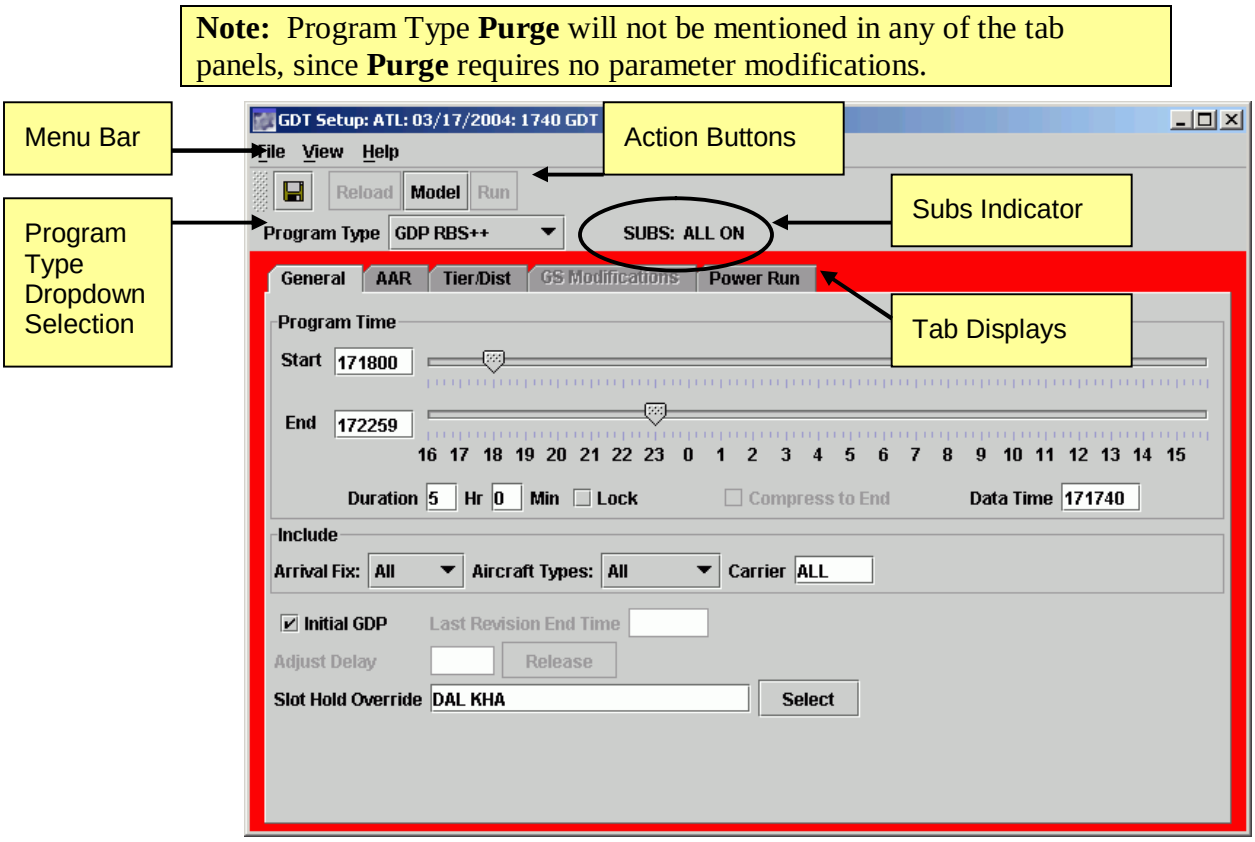

Figure 4-2: GDT Setup Component

General Tab:

The General Tab is active for all Program Types and is the default Tab that opens when the *GDT Setup* component is opened. Within this panel you can enter the Program Time, Include Arrival Fix and Aircraft Types, Select Initial GDP or Revision Time, Adjust Delay, and select Slot Hold Override. Options, which are not features for certain program types, will be grayed out.

Program Time: Start and **End** time parameters can be edited for all Program types except for Data time in Airborne Holding. You can populate the times in the text box to the right of the time field or use the slide bars, which automatically fills the time into the text box.

- Start Time: Enter the date and time when the GDP will begin.
- End Time: Enter the date and time when the GDP should end.

Once a **Start** time is selected, you can either select the **End** time or enter the **Duration** of the program in the **Hr** and **Min** text boxes. The End time of the program will adjust automatically based on the Start time if a duration time is entered. Putting a checkmark in the box next to **Lock** will "fix" the duration time of the program. This is helpful when you wish to change the Start time, but not decrease/increase the program length.

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- Compress to End: This functionality is only available during a Compression. When checked, all flights that have a control times will be eligible for compression.
- The Data Time is the ADL time that you are modeling and analyzing your TMI on. Set the time to be used as the current time. This time can be set forward or back without changing the data. If you change the Data time, a warning box will be displayed letting you know the "Data time changed from default" and the time is highlighted in red. Changing the data time back to the default ADL time will put the Data text field back to normal.

Note: The default ADL time is always displayed in the *GDT Setup* Title bar.

Include: Parameters can be selected for **Arrival Fix**, **Aircraft Types**, and **Carrier** for all Program Types except Compression and Airborne Holding. The default is set to **All** for the three parameters listed below.

- *Arrival Fix*: Use the drop-down menu to determine which Arrival Fixes to include in the operation. You can select All **or** one individual fix.
- *Aircraft Types*: Choose All, Jet Only, or Prop Only from the Aircraft Types drop-down menu to specify the aircraft types included in the GDP operation.
- *Carriers*: Leave "All" to include all carriers at that airport. If you want to only include a single airline, type the carrier's 3-letter code into the text box. Please note that the application will not allow you to include only one carrier without including its sub-carriers. Likewise, you cannot choose to include one sub-carrier. Typing a carrier code into this field will always include the major and its sub-carrier(s).

Initial GDP and **Last Revision End Time** option is only available for GDP RBS++ and RBS only. If the program in place is the initial program (there is not a program currently running for that airport) the Initial GDP checkbox should be selected. If you are running a revision, the **Last Revision End Time** will be filled out and the Initial GDP checkbox should be unchecked. It is important that **Initial GDP** is not selected during a revision.

Adjust Delay: This parameter is only available when using the Blanket Program Type. Adjust delay can be used to add or release a specified amount of time from selected criteria. Blanket should only be used during a GDP. For example, if you had a hole in the traffic flow, you could choose centers, distance, fixes, or aircraft types and enter in a negative number to release some delay or release all delay by selecting the **Release** button on the General Tab. **Release** will fill in the Adjust Delay text field with *–999*, which is equivalent to releasing all delay. Alternatively, you can add delay to the selected criteria by manually entering the amount of extra delay in minutes.

Slot Hold Override: Parameters can only be changed for RBS++, RBS, and Compression. The Slot Hold Override field allows you to override an airline's slot holding status by either typing an airlines' three-letter identifier directly in the text field next to **Slot Hold Override** or click the **Select** button to open the Select Slot Holding window as shown in Figure 4-3. . The Select Slot Holding window lists the airlines currently holding slots at the airport and allows use to choose which airline(s) to

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override. Click the box next to each airline to override its slot holding status and include the slot in compression. When a box is checked, that airline will no longer hold slots. When the boxes are not checked, those airlines will still be allowed to hold slots.

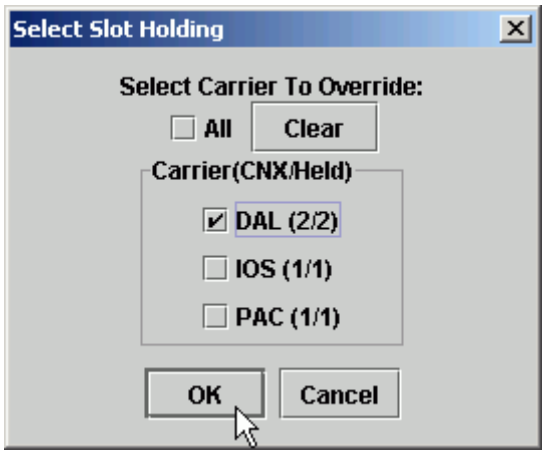

Figure 4-3: Slot Holding Override Window

AAR Tab:

The AAR tab is active for all Program Types except Compression and Blanket. The AAR Tab panel is almost identical to the *Modify AAR Rates* window accessed from the Demand Rates Menu option from the Control Panel component.

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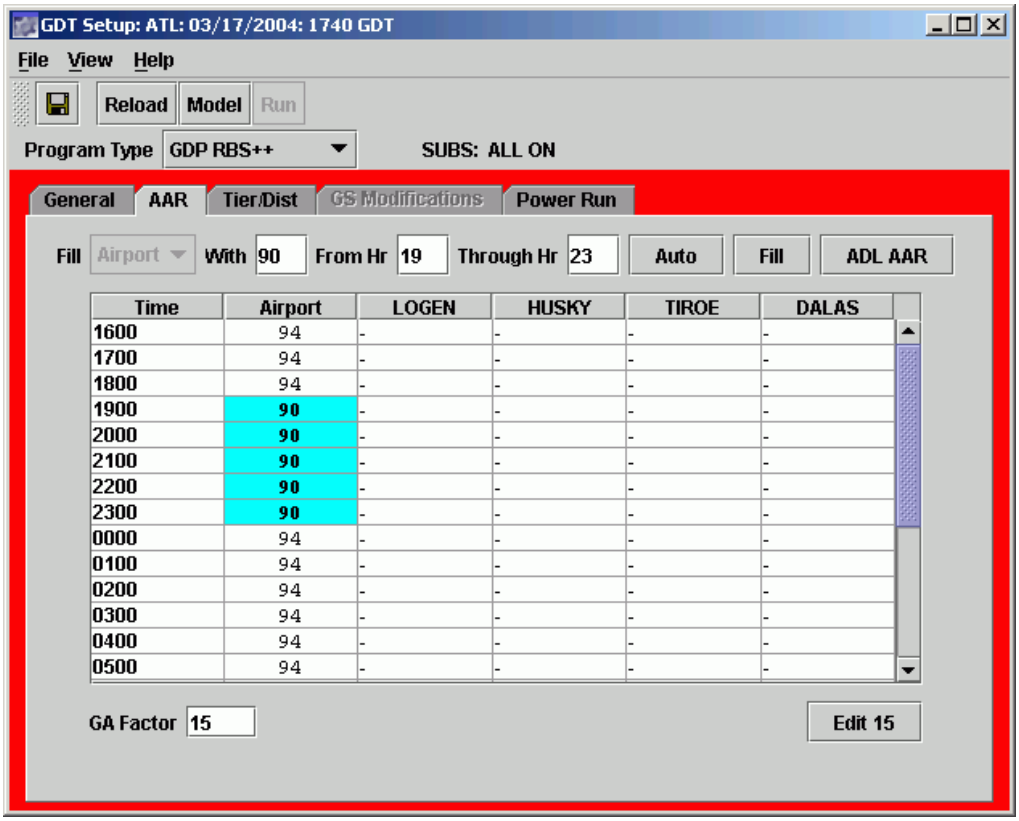

Figure 4-4: GDT Setup - AAR Tab

Fill in the program rates using the method described in the Control Panel subsection of Chapter 3. There are two additional features to the GDT AAR Tab, which are not included in *Modify AAR Rates*; the **Auto** Button and the **GA Factor** field. You can click the **Auto** button to fill the **From Hr** and **Through Hr** fields to match the Program Time specified in the General Tab. Clicking the **Fill** button after entering the AAR rate and hours, the AAR will automatically fill in the appropriate hour rows. **GA Factor** input parameter is not available in GS Immediate or GS Future Program Types. The **GA Factor** is meant to account for potential "pop-up" flights. That is, if the AAR for a certain number of hours is changed to 40 with a GA Factor of 5, the AAR that FSM uses to run the GDP will be 35. This leaves room for any unknown flights that show up in that hour because the actual capacity of the airport is 40.

> **Note:** Changing AARs for fixes is not a functional option. The Fill drop-down will only have Airport as a valid entry. Assigned AARs for certain fixes will be a future enhancement.

Tier/Dist Tab:

The Tier/Dist tab is active for all Program Types except Compression and Airborne holding. The Tier/Dist Tab has two types of exemption criteria, Tier based and Distance based. In the Exempt By dropdown box, select either a Tier or Distance based initiative.

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Tier/Distance Tab with Exempt By *Tier* Selected

When *Exempt By* **Tier** is selected, the panel illustrated below will be displayed. The panel contains three sections where parameters can be modified: Centers, Airports, and Flights.

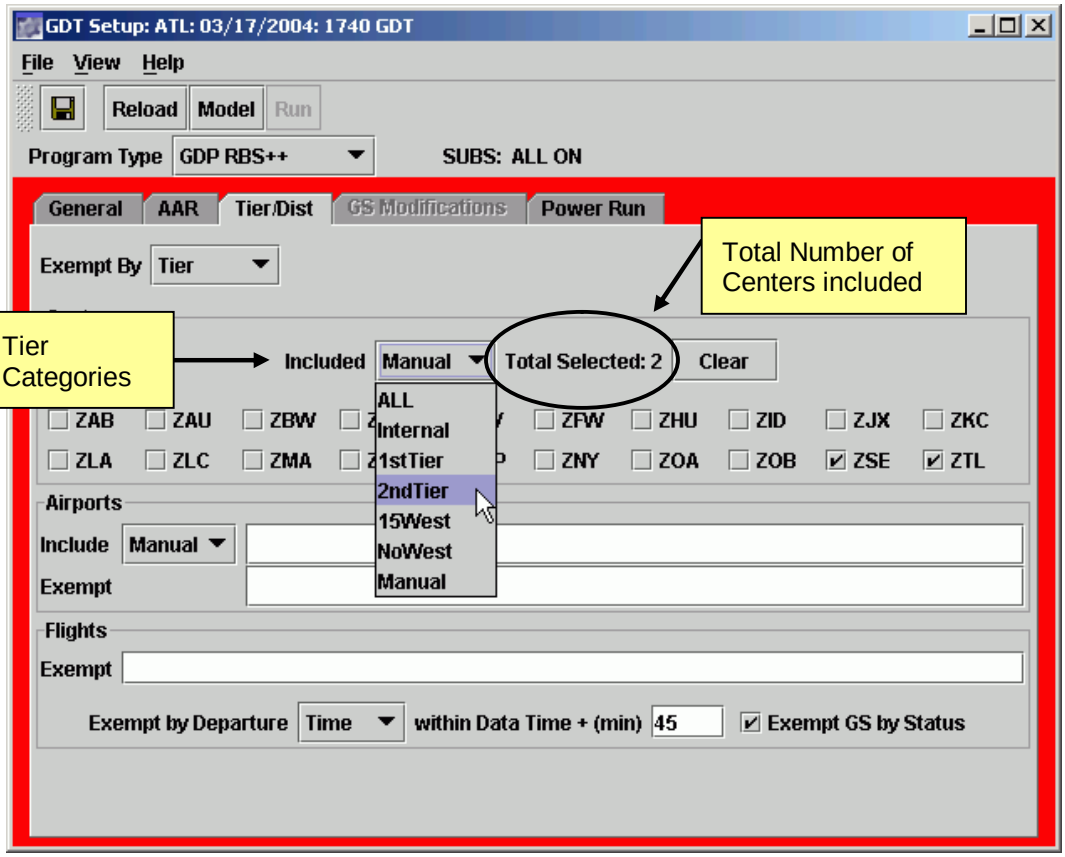

Figure 4-5: GDT Setup – Tier Tab

Centers: You can manually select the centers you wish to include in the program or select a Tier level from the **Included** drop-down menu:

- *Included*: Select a tier option from the drop-down menu. Selecting a Tier automatically selects the associating centers. The total number of centers selected is displayed to the right of the Tier selection. Click **Clear** to erase all centers with checkmarks and return to the Included tier selection back to Manual.
- **Manual Center Selection:** Click on the checkbox to select or unselect individual centers to include in the program.

Airports: This section of the panel allows you to include and/or exempt airports:

- *Include*: You may choose to include certain departure airports from a TMI that were not originally included based on the Center section criteria. Enter the 3 or 4-letter airport code to include that airport. Separate airports with a space or a comma.

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- *Exempt*: You may choose to exempt certain departure airports from a TMI. Enter the 3 or 4-letter airport code to exempt that airport. Separate airports with a space or a comma.

Flights: This section of the panel allows you to exempt, give no delay, to priority flights as well as choosing Exempt by Departure Status or Time.

- *Exempt***:** Enter a flight's ACID to exempt priority flights from the Ground Stop.
- *Departure Time/Status*: To exempt flights based on their Departure Time or Departure Status, click the drop-down menu to select the desired option. When exempting a flight based on departure time, enter a value in the **within Data Time + (min)** text field. The value should equal the number of minutes relative to the data time to exempt flights that depart within that time. For example, to exempt flights departing within 20 minutes of the current time, enter 20 in the **within Data Time + (min)** [default value is 45]. If you base your exemptions on Departure Status, you do not need to fill out any further parameters in this field.
- *Exempt GS Flts by Status*: Checking this box will exempt GS flights according to their departure status. GS flights that have not departed (are on the ground and not airborne) will be included in the GDP. This checkbox is selected by default.

Tier/Distance Tab with Exempt By *Distance* Selected

When *Exempt By* **Distance** is selected, the panel illustrated below in Figure 4-6 will be displayed. The Distance panel contains four sections in which the parameters can be modified: Distance, Centers, Airports, and Flights.

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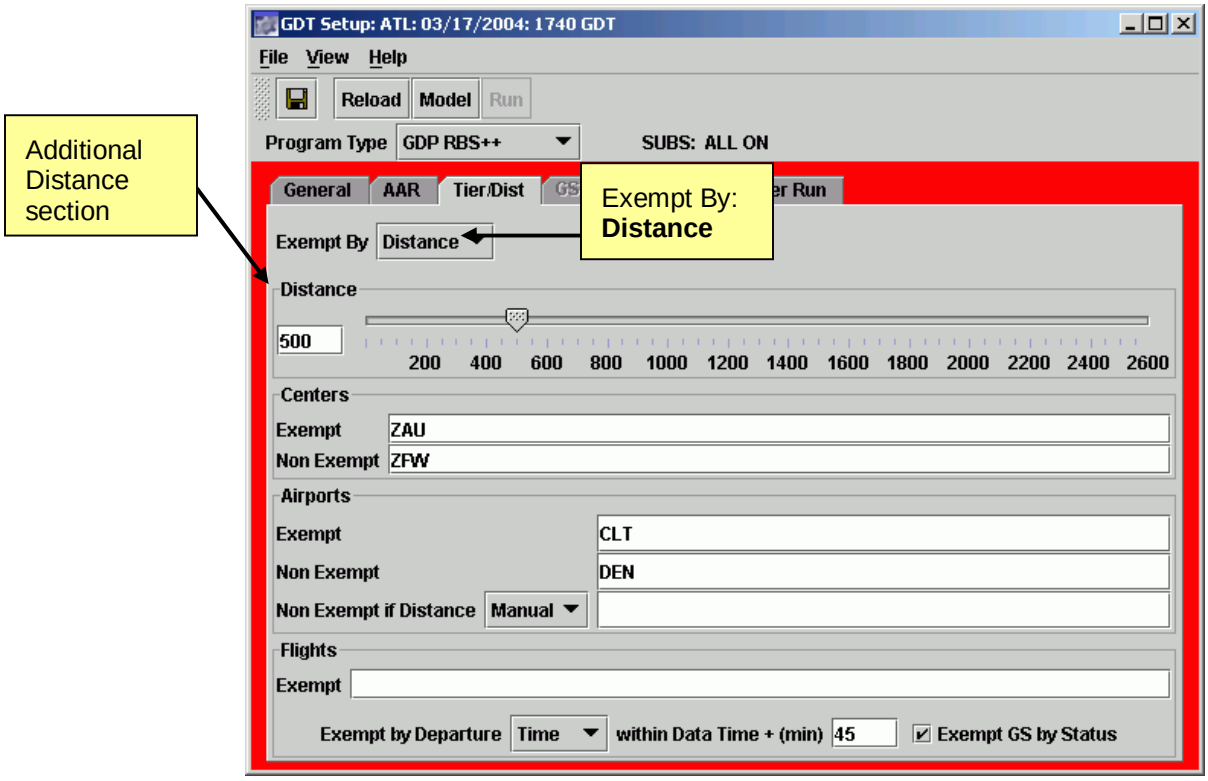

Figure 4-6: GDT Setup - Distance Tab

Distance: When the Distance Panel is first displayed, the default distance is 200 nautical miles. You can enter in your distance range directly into the Distance textbox or click and drag the sliding bar for the desired distance; this automatically fills in the distance. Remember, anything changed in the Setup panel will be reflected in the GDT Map. You can dynamically change the distance range from the Setup Panel and simultaneously view the range ring and what centers/airports are affected from the GDT Map.

Centers: You can manually enter centers to be Exempt (receives no delay) or Non Exempt (receives delay).

- **Exempt**: You may choose to exempt certain centers from a TMI that were originally, partially, or entirely, included based on the Distance criteria. Enter the 3 or 4-letter center identifier to exempt a particular center(s). Separate multiple centers with a space or a comma.
- **Include:** You may choose to include certain centers from a TMI that were not included originally based on the Distance criteria. Enter the 3 or 4-letter center identifier to include a particular center(s). Separate multiple centers with a space or a comma.

Airports: This section of the panel allows you to include and/or exempt airport(s).

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- **Exempt:** You may choose to exempt certain departure airports from a TMI. Enter the 3 or 4-letter airport code to exempt that airport(s). Separate multiple airports with a space or a comma.
- **Non Exempt:** You may choose to include certain departure airports from a TMI that were not included originally based on the Distance criteria. Enter the 3 or 4-letter airport code to include that airport(s). Separate multiple airports with a space or a comma.
- **Non Exempt if Distance:** This field is used to include Canadian airports. If you select a Canadian airport, FSM will include that airport if it falls within the selected distance parameter.

Flights: This section of the panel allows you to exempt, giving no delay, to priority flights as well as choosing Exempt by Departure Status or Time.

- **Exempt:** You may choose to exempt certain flights from a TMI. Enter a flight's call sign in text field. Separate multiple flights with a space or a comma.
- **Departure Time/Status:** To Exempt flights based on their Departure Time or Departure Status, click the pull-down menu to select the desired option. When exempting a flight based on departure time, enter a value in the within Data Time + (min) text field. The value should equal the number of minutes relative to the data time to exempt flights that depart within that time. For example, to exempt flights departing within 20 minutes of the current time, enter 20 next to Data Time + (min). [default value is 45]. If you base your exemptions on Departure Status, you do not need to fill out any further parameters in this field.
- **Exempt GS Flts by Status:** Checking this box will exempt GS flights according to their departure status. GS flights that have not departed (are on the ground and not airborne) will be included in the GDP. This checkbox is selected by default.

GS Modifications Tab

The GS Modifications Tab is only available for GS Immediate and GS Future Program Types. This Tab is used to input additional information/parameters for Ground Stops.

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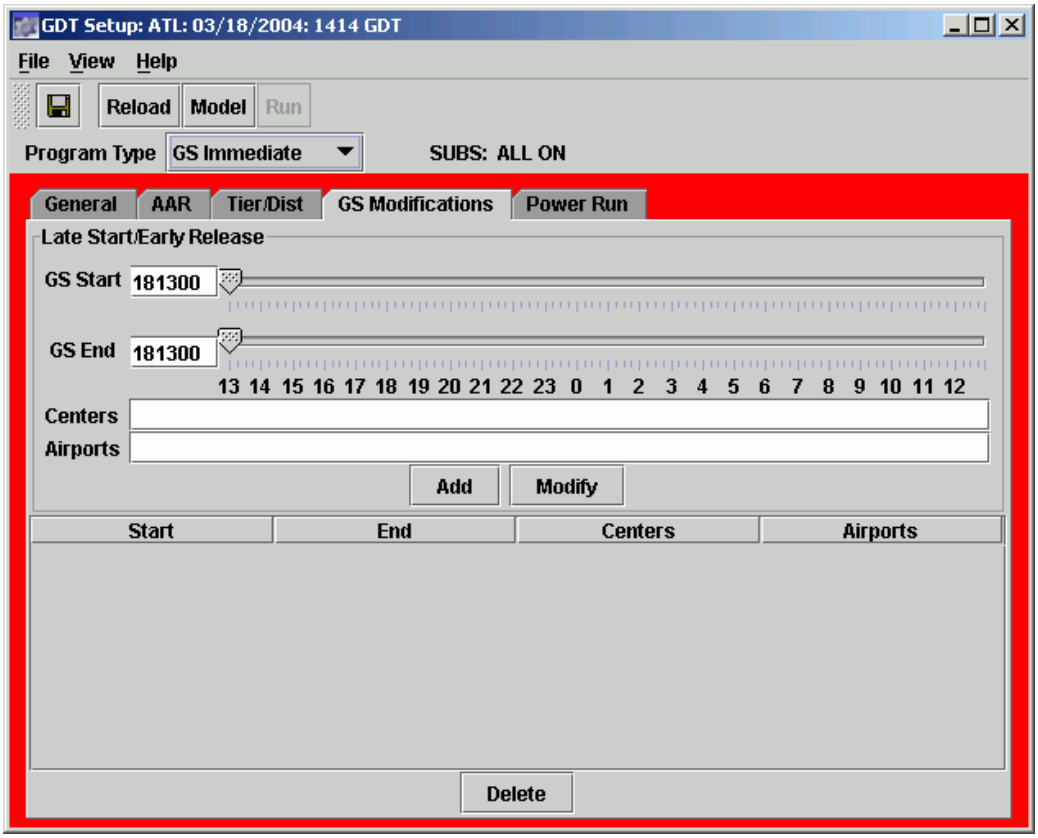

Figure 4-7: GDT Setup - GS Modifications Tab

Late Start/Early Release: You can add two additional statements to fine-tune a Ground Stop program. Using this option you can specify an additional center or airport at which to run a Ground Stop. Note that the Ground Stop parameters set in this field can have a Start and Stop time that differs from the main Ground Stop. All other parameters in the Ground Stop initiative remain the same. The statements you add to this field can be edited or deleted. To edit, select the center or airport then press **Modify**. To delete, select the center/airport and then press **Delete** at the bottom of the Panel.

- **GS Start and GS End:** For the selected Centers /Airports, you can specify time parameters that differ from the main Ground Stop. All other parameters in the Ground Stop remain the same.
- **Centers:** You can add additional center(s) to run a Ground Stop. Enter the 3 or 4-letter center name and then press Add. Separate centers with a space or a comma.
- **Airports:** You can add additional airports to run a Ground Stop. Enter the 3 or 4-letter airport code and then press Add. Separate airports with a space or a comma.

Power Run

The Power Run Tab is only available for GDP RBS++, GDP RBS, GS Immediate, and GS Future Program Types. Once the parameters are set, you may want to determine which parameters will run the best GDP. In this case, you can take advantage of FSM's

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powerful analysis capabilities to view the results of the parameters you have selected before actually running the operation.

The Power Run Tab in the *GDT Setup* component is used as an analysis tool. There are four GDP and three GS Power Run operations, which analyze the results for any program. You can select these options from the drop-down menu that appears next to **Power Run By**. The Power Run function is used to determine whether the parameters need to be modified. When any Power Run is generated, FSM automatically saves the Power Run to a file.

Once you have clicked **Run** on the *GDT Setup* component, you still have the option to analyze the parameters used. A post-operation evaluation, called the *Analysis Report*, is generated by FSM when you click **Run**. The Analysis Report is an option on the Reports menu in any delay operation Coversheet.

To view a scenario, select the type of program to model in the **Power Run By** drop-down menu and press **Model**. Model will display the effects of potential operation parameters and how traffic at the airport would be affected by using these parameters for an actual program in all GDT components. Review the program statistics in the *Data Graph*. To preview the effects of running a Power Run scenario as an actual program, move the black line on the *Data Graph* component to other options displayed on the X-axis. This is discussed in more detail below in the *Data Graph* Component Section.

With the exception of Power Run for Decision Time, you can preview the proposed parameters and its effect on the airport's traffic.

> **Note:** After the **Model** button has been pressed, the Setup Panel no longer contains a red border, which indicates that all the components reflect the information in the *GDT Setup* component.

Power Run Options

The different options when using **Power Run By** describes what data will be reflected on the X-axis of the Data Graph and the headers in the Data Table (see Figure 4-8). Depending on which Program Type you select determines which options appear in the Power Run By drop-down menu. All GDP functions will have "GDP" listed before the Power Run type and all GS functions will have "GS" listed before the Power Run Type.

Program Type	Power Run By Options
GDP RBS++ **GDP RBS**	GDP Center Group
	GDP Data Time
	GDP Distance
	GDP Decision Time
	GDP Center Group & Data Time
	GDP Data Time & Distance

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Program Type	Power Run By Options
GS Immediate **GS Future**	GS Center Group
	GS Time Period
	GS Center Group & Time Period

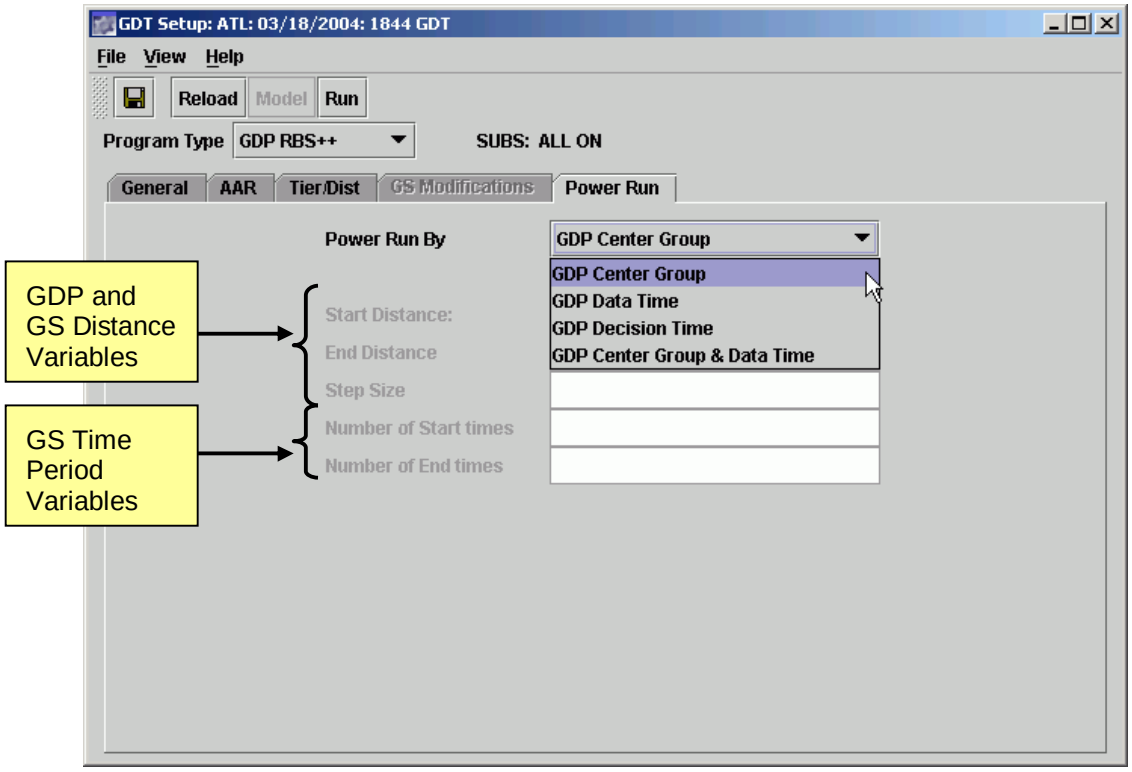

Figure 4-8: GDT Setup - Power Run Tab

Note: Distance variables are only editable when a Distance based Program is being modeled.

- **Center Group:** Available for both GDP and GS Program types, this option allows you to view the effect of the "proposed parameters" on the different center groups. The post-operation demand rate for each hour for a specific group of centers is displayed in the Data Graph. Other information displayed, includes average delay, number of affected flights and total delay.
- **GDP Data Time:** From the Setup Panel select GDP Data Time in the Power Run By drop-down menu. This option is only available for GDP program types. This option allows you to view the effects of the proposed GDP according to the time the GDP is issued. Using the display, you can determine how far in advance the GDP needs to be issued. Any hour whose demand still exceeds the AAR is highlighted in red.

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- **GS Time Period:** From the *GDT Setup* component, select GS Time Period in the Power Run By drop-down menu. This option is only available for GS program types. This function shows you the effect of running a ground stop for various lengths of time. When GS Time Period is selected, two text fields become active: *Number of Start Times* and *Number of End Times*. The default for both is set to 2, but you can manually enter in another value to meet your analysis needs.

Note: If you decide to run a ground stop for longer than one hour, FSM provides a warning message to make sure you want the ground stop to last for that duration.

- **Distance**: From the *GDT Setup* component, select Distance from the Power Run By drop-down menu when modeling either a GDP or GS. This function shows you the effect of running a GDP or GS for various distance parameters. When Distance is selected from the Power Run By drop-down menu, three text fields become active in the Power Run Tab: Start Distance, End Distance, and Step Size (distance increment). The default is set to start at 200 nautical miles and End at 2000 nautical miles with a Step Size of 200 nautical miles. You can manually input your desired distance and increment range into the appropriate text fields.
- **GDP Decision Time**: From the *GDT Setup* component, select GDP Decision Time from the Power Run By drop-down menu. Decision Time is an available only with GDP operations. This function displays the optimum time to run the proposed GDP including specific Center Groups. The optimum GDP time is defined as the latest "half hour" in which running a GDP will not cause the demand in the first hour of the GDP to exceed the AAR. Power Run for Decision Time displays each center group with the optimum GDP Time. If a center group cannot benefit from a GDP, "NA" will appear below that center group.
- **GDP Center Group & Data Time**: From the *GDT Setup* component, select GDP Center Group & Data Time from the Power Run By drop-down menu. This option is only available for GDP program types. This function combines Power Run by Center Group and Power Run by Data Time. When you perform Power Run by Center Group & Data Time, you can view all available options to run a GDP using a particular center group at various data times.
- **GDP Data Time & Distance:** From the *GDT Setup* component, select GDP Data Time & Distance from the Power Run By drop-down menu. This option is only available for GDP program types. This function combines Power Run by Data Time and Power Run by Distance. When you perform Power Run by Center Group & Data Time, you can view all available options to run a GDP using a particular distance at various data times. Just as in the Distance set up, three text fields become active in the Power Run Tab: Start Distance, End Distance, and Step Size (distance increment). The default is set to start at 200 nautical miles and End at 2000 nautical

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miles with a Step Size of 200 nautical miles. You can manually input your desired distance and increment range into the appropriate text fields.

- **GS Center Group**: This Power run allows you to see different statistics for all center groups. The Data Graph's X-axis and the Data Table's column header display the various center groups. This option is only available for GS program types
- **GS Time Period**: This Power run allows you to see different statistics for different Time Periods. You can specify the number of Time Periods by typing a number in the **Number of Start times** and **Number of End times'** textboxes on the Power Run Tab. The Data Graph's X-axis and the Data Table's column headers display the various Time Periods. This option is only available for GS program types
- **GS Center Group & Time Period:** This Power Run allows you to see which combination of center groups and time periods put in the ground stop parameters would produce the best program. The Data Graph's X-axis and the Data Table's column headers display the various Time Periods and Center Group combinations. This option is only available for GS program types.

GDT Setup Panel Menu Bar

Figure 4-9: GDT Setup Menu Bar

The menu bar (shown above) in the *GDT Setup* component contains three options: **File**, **View**, and **Help**.

1. **File Menu:**

File > *Load Proposed Parameters* – Opens a secondary drop-down menu to select from specific parameter options:

> *Ground Delay Program* – Loads the proposed GDP parameters.

> *Ground Stop* - Loads the proposed Ground Stop parameters.

> *Blanket* - Loads the proposed Blanket parameters.

> *Compression* - Loads the proposed Compression parameters.

File > *Load Actual Parameters* - Opens a secondary drop-down menu to select from specific parameter options:

> *Ground Delay Program* - Loads the actual GDP parameters.

> *Ground Stop* - Loads the actual Ground Stop parameters.

> *Blanket* - Loads the actual Blanket parameters.

> *Compression* - Loads the actual Compression parameters.

File > *Open Coversheet* – Opens the Coversheet file exploder that contains all the Coversheet files. Select the Coversheet you wish to open and press **Open**. Coversheet files are all named covr.xxx, where xxx is the airport three-letter

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identifier. The Date and ADL time followed by what kind of Coversheet (GS, GDP, or CNX) is also included in the file names.

File > *Open Parameters File* – Opens the PARAM_DIRECTORY File in file explorer. Select the parameters file and press **Open** to view the Parameters Files.

File > *Save as* - Saves the *Setup* component as a .jpg image to a directory of your choice.

File > *Close* - Shuts down the *Setup* component and all the complimentary GDT components for that particular airport.

10. **View Menu:**

View > *Rename Window…*- Displays the Rename Window dialog box and allows you to change the component name in the title bar. Enter the desired name then press **OK** to change the title bar heading. Press **Cancel** to close the Rename Window dialog box without making any changes.

Figure 4-10: Rename Window Dialog Box

There are five additional display options to choose from under the **View** menu. You can view the *GDT Time Line* and *GDT Data Table* components, which are not displayed by default, from this menu option. If you close a component and wish to reopen it, use the **View** menu options to select and reopen the desired component.

View > *Data Graph* - Displays the *Data Graph* component

View > *GDT Map* – Displays the *GDT Map* component.

View > *Demand Graph* – Displays the *Bar Graph* component.

View > *Time Line* **–** Displays the *GDT Time Line* component.

View > *Data Table* **–** Display information that is found in the Data Graph component, but in table format.

View > *Flight List* – Displays the Flight List for the monitored airport. The default Flight List will include AC, ID, ETD, ETA, DEST, ORIG, and ARTA-CTA data elements.

11. **Help Menu**:

Help > *GDT Setup* - Accesses the web-based on-line help for the *GDT Setup* component.

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GDT Map Component

The *GDT Map* component is one of four components that automatically open when the **GDT Setup** button is selected from the *Control Panel*. The *GDT Map* component is similar to the display of the *Status Map* component, however the functionality is different. Selections made in the *GDT Setup* component will reflect automatically in all the other GDT components. Airports currently being monitored by the server are displayed with the airports three-letter identifier and a colored dot that indicates the GDT status of each airport. The title bar displays the normal component labeling conventions. GDT is displayed at the end of the title bar label to indicate that you are looking at the Map in GDT mode. When GDT mode is initially opened, the GDP *Setup* component has the exempt by tier with Internal centers included selected by default on the Tier/Dist Tab. Therefore, the GDT map initially has only the airport's Internal center selected. When a center is included, it will be colored with a maroon overlay and the airports that are within the centers are colored red as shown in Figure 4-11. The color red for an airport indicates that the airport is included in a Traffic Management Initiative. A green colored airport indicates that the airport is exempt from delay.

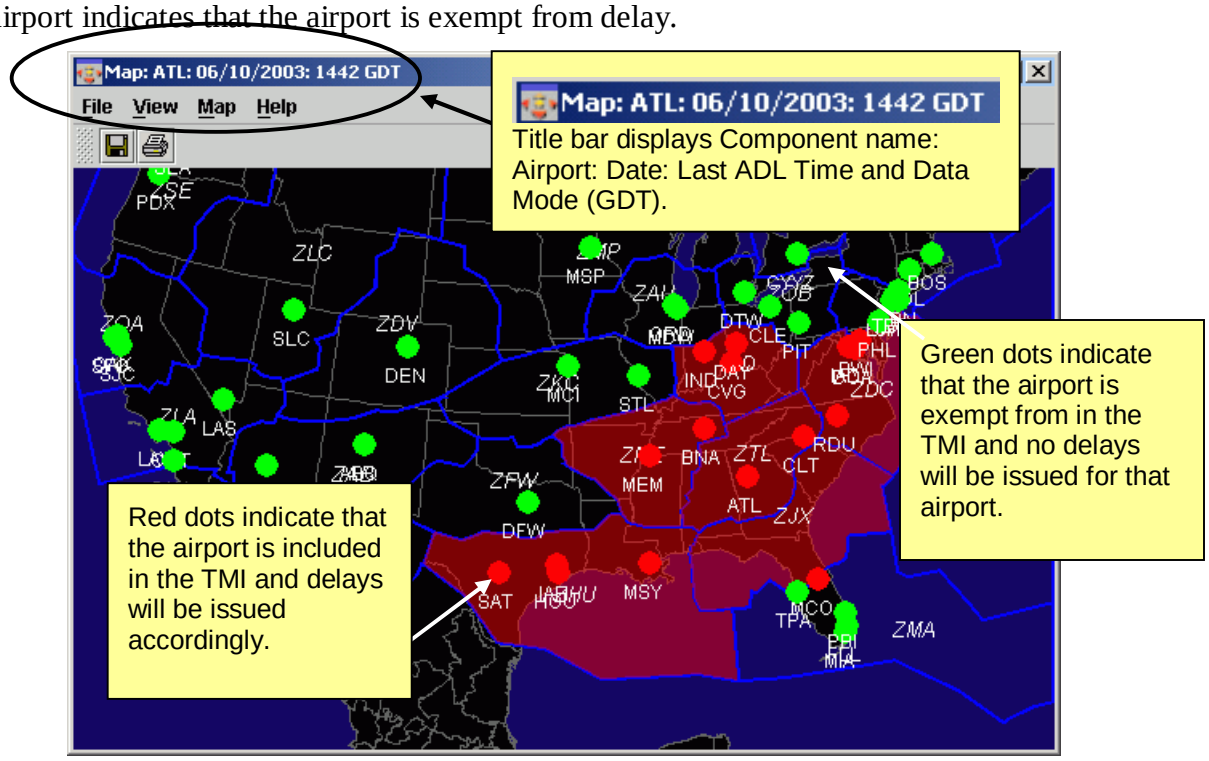

Figure 4-11: GDT Map Component

The *GDT Map* component allows you to design a TMI visually by selecting/deselecting airports and/or centers. Selecting/Deselecting airports, centers, and adjusting the distance range will interactively update other GDT components.

GDT Map Zoom Capabilities

The zoom capabilities on the GDT Map component are identical to the *Status* Map component. There are several different ways to issue this command, each working slightly differently:

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Quick Key Method

Using Z on your keyboard will incrementally zoom into the center of your screen. Similarly, using U on your keyboard will incrementally zoom out from the center of your screen. To move the center focus of your screen to another area of focus or to zoom in on a particular airport, move the cursor to the desired location and press M on the keyboard. Quick key M will move the center focus of the map to the cursor location. To zoom in/out from that point, continue to use Z or U quick keys. Additionally, pressing X on the keyboard will undo last command for up to 25 commands.

Quick Key	Description
M	Move
Z	Zoom
U	Unzoom
X	Undo Move/Zoom

Drag and Drop Method

To zoom out, hold down the left mouse button and drag the curser up and left. The larger the box you draw, the zoom will be much further out. To zoom in, hold down the left mouse button and drag any direction, besides up and left, around the area you wish to zoom in on.

Right Click Method

After using either method listed above, right-clicking the mouse anywhere within the Map component will give you three options: reset zoom, redo zoom, or undo zoom. Reset zoom will take you back to the initial zoom setting. Undo zoom, will undo the last zoom command, same as using the X quick key. Redo zoom will zoom back into your last zoom setting after an Undo zoom command has been used.

Note: The Drag and Drop Method can be imprecise, it is recommended to us the Quick Key Method.

Distance Based GDPs

When a distance based GDP is selected in the *GDP Setup* component, a maroon colored "range ring" will appear on the *GDT Map* component. The default distance is set to 200 nautical miles. The range distance is indicated on the *GDT Map* just outside the top of the ring. In addition to adjusting the range from the *GDT Setup* component, you can alter the distance directly from the *GDT Map*; put your cursor on the edge of the distance ring until the cursor turns into direction arrows, then hold down the left mouse button and drag and drop to increase or decrease the distance. All airports within the range limit are automatically included into the program and colored red. To exclude an airport from within the distance range, just click on the dot for that particular airport. Clicking on an airport within the distance ring will turn the dot to green and exclude that airport from

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program delay. Any additional airports selected will be reflected in the *GDP Setup* component in the Airports: Non Exempt or Exempt field in the Tier/Dist Tab. Likewise you can select/deselect centers to be included in a program from the *GDT Map*. Clicking once on a center will include the center into the program. The color of the selected center will change to maroon and the airports within that center will change color indicating that they are included in the program as well. The selected center is reflected in the *GDP Setup* component in the Centers: Non Exempt field in the Tier/Dist Tab. ZFW in Figure 4-12 and Figure 4-13 is an example of a user selected non-exempt center.

Note: Clicking only once on a center that is already included within the program selection will not reflect any visual difference on the screen.

Clicking twice on a selected center will exempt that center from the program. The selected center will turn to black and the airports within the center will turn green to indicate that they are exempt from delay. The center selected will reflect in the GDP Setup component in the Centers: Exempt field in the Tier/Dist Tab. Figure 4-12 is an example of a user selected exempt center (ZAU). Clicking on a center a third time will put the center selection back to the distance based default selection.

Mouse Action	Description
Click on Airport	Toggle an airport from Exempt/Non-exempt
Click on center once	Includes Center in program
Click on center twice	Exempts center from program delay
Click on center three times	Default selection by distance

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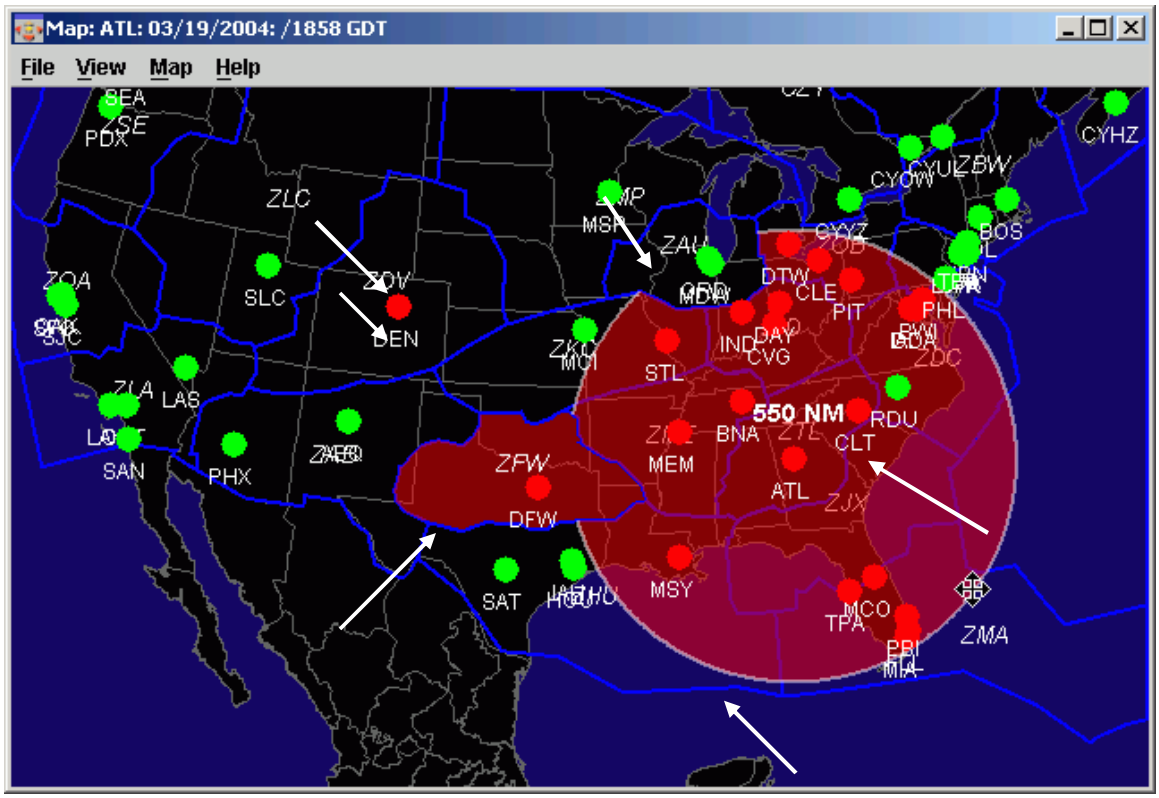

Figure 4-12: GDT Map Setup

Figure 4-13 is the GDT Setup component, which corresponds with the GDT Map component setup in Figure 4-12.

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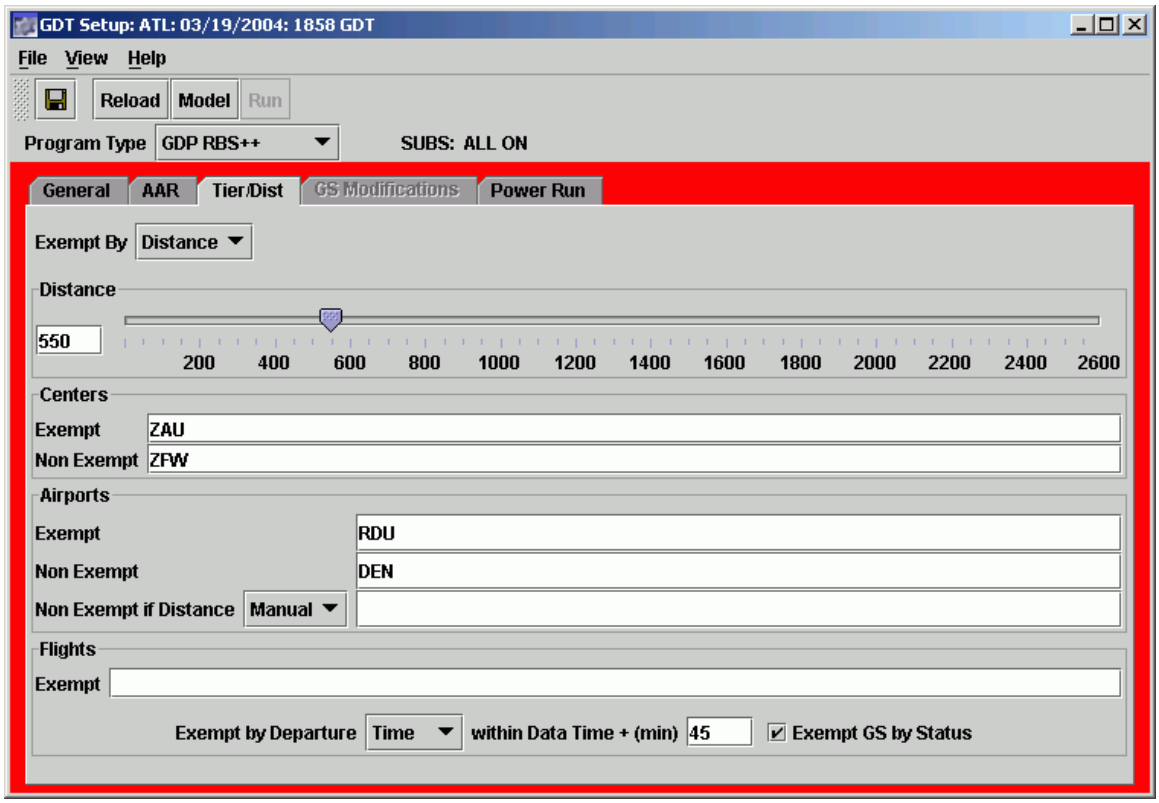

Figure 4-13: GDT Setup reflected GDT Map component

Tier based GDPs

The initial default setting when GDT Mode components are opened is an ALL Tier based GDP. When a tier based GDP is selected from the *GDP Setup* component, all centers included in a TMI will be colored maroon on the map and all airports included will be colored red. For example, the next figure illustrates a 1st Tier GDP with user selected airport, ATL, as an additional Non-Exempt airport. The method of selecting/deselecting airports and/or centers is the same as described above in the distance based GDP.

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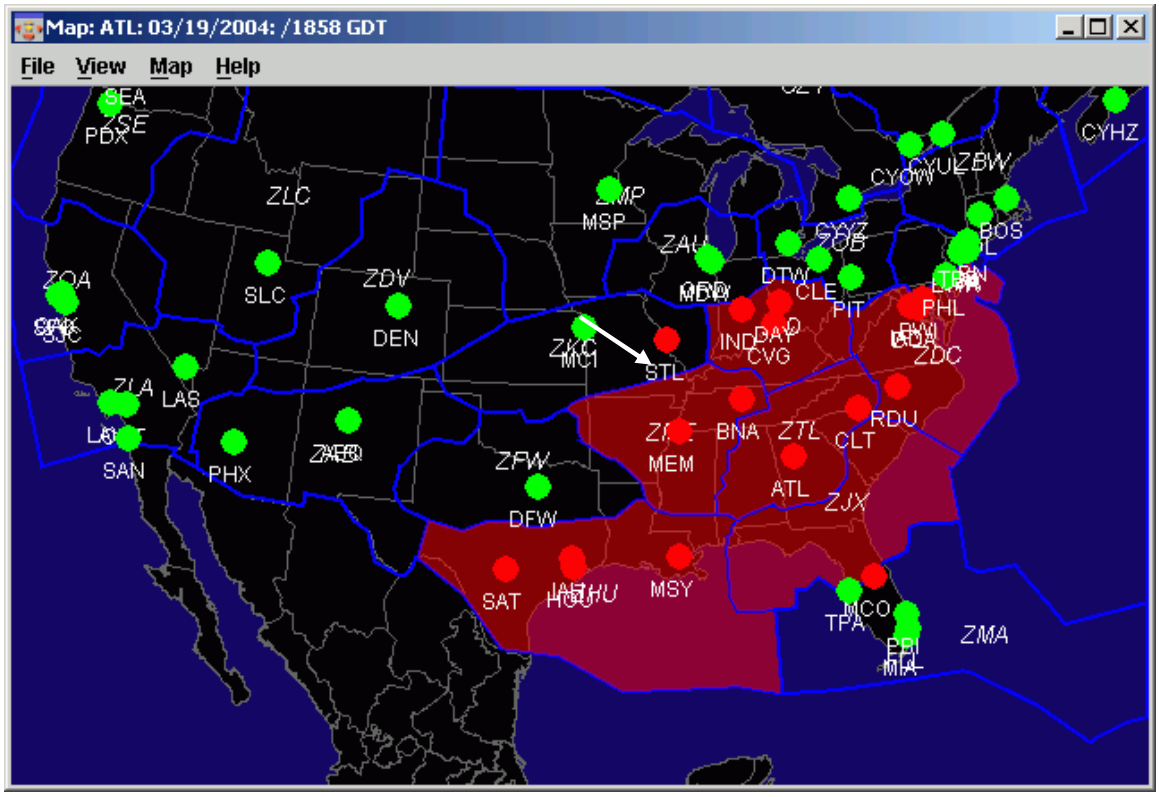

Figure 4-14: ATL 1st Tier Program

Figure 4-15 displays the GDT setup component that corresponds with the GDT Map component in Figure 4-14.

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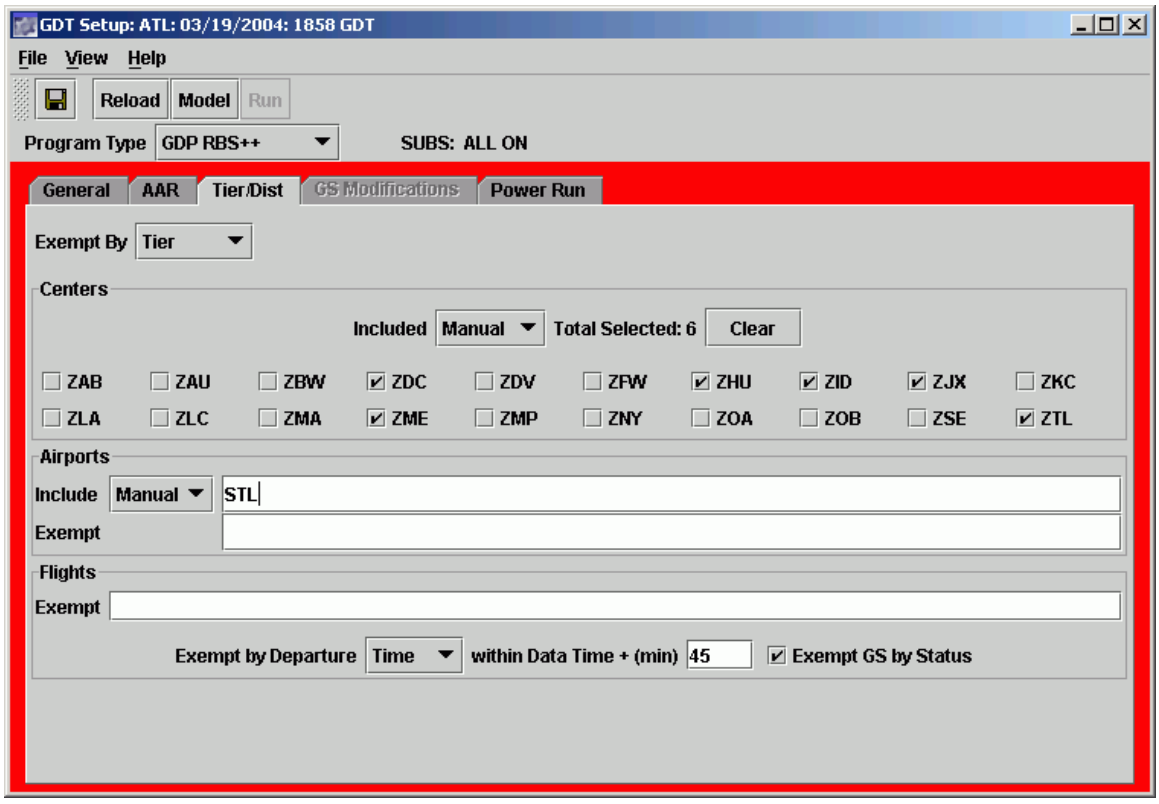

Figure 4-15: GDT Setup Component ATL 1st Tier

GDT Map Menu Bar

Figure 4-16: GDT Map Component Menu Bar

The *GDT Map* component menu bar contains three options: **File**, **View**, and **Help**.

1. **File Menu:**

File > *Save as* **-** Saves the *GDT Map* as a .jpg image in a directory that you specify.

File > *Print* **-** Prints the *GDT Map* that is active on your screen.

File > *Close* **-** Shuts down the *GDT Map* component.

2. **View Menu:**

View > *Rename Window…*- Displays the Rename Window dialog box and allows you to change the title bar name. Enter the desired name then press **OK** to change the title bar heading as shown in Figure 4-17. Press **Cancel** to close the Rename Window dialog box without making any changes.

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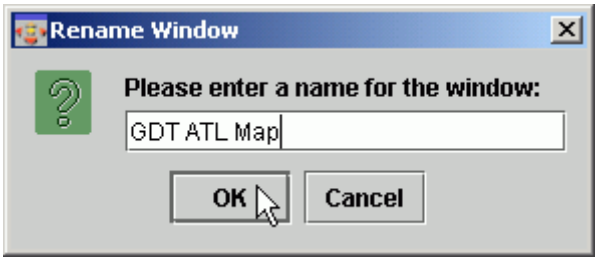

Figure 4-17: Rename Window Dialog Box

12. **Help Menu:**

Help > *Map* - Opens a web-based on-line help system.

GDT Bar Graph Component

The *GDT Bar Graph* component is one of four components that open automatically when you select the **GDT Setup** button from the *Control Panel* component. The *Bar Graph* allows you to view arrival demand at the airport being monitored and compares actual data with proposed parameters. Use the **Model** button on the *GDT Setup* component to view the modeled parameter results in the Bar Graph as well as the *Data Graph* component. The GDT Bar Graph menu and Tab options are almost identical to that of the Monitored (Live) Graph. Please review Chapter 3: *Bar Graph* Component for more detail. There are some minor differences in the GDT Graph. In GDT mode, only arrival information is displayed, therefore under the **View** menu there is no *ADL ADR Line* or *Model ADR Line* option.

One of the key differences of *GDT Bar Graph* is that it will always display both solid and hashed bars. Solid bars represent the original data, while hashed bars represent modeled data (see Figure 4-18.

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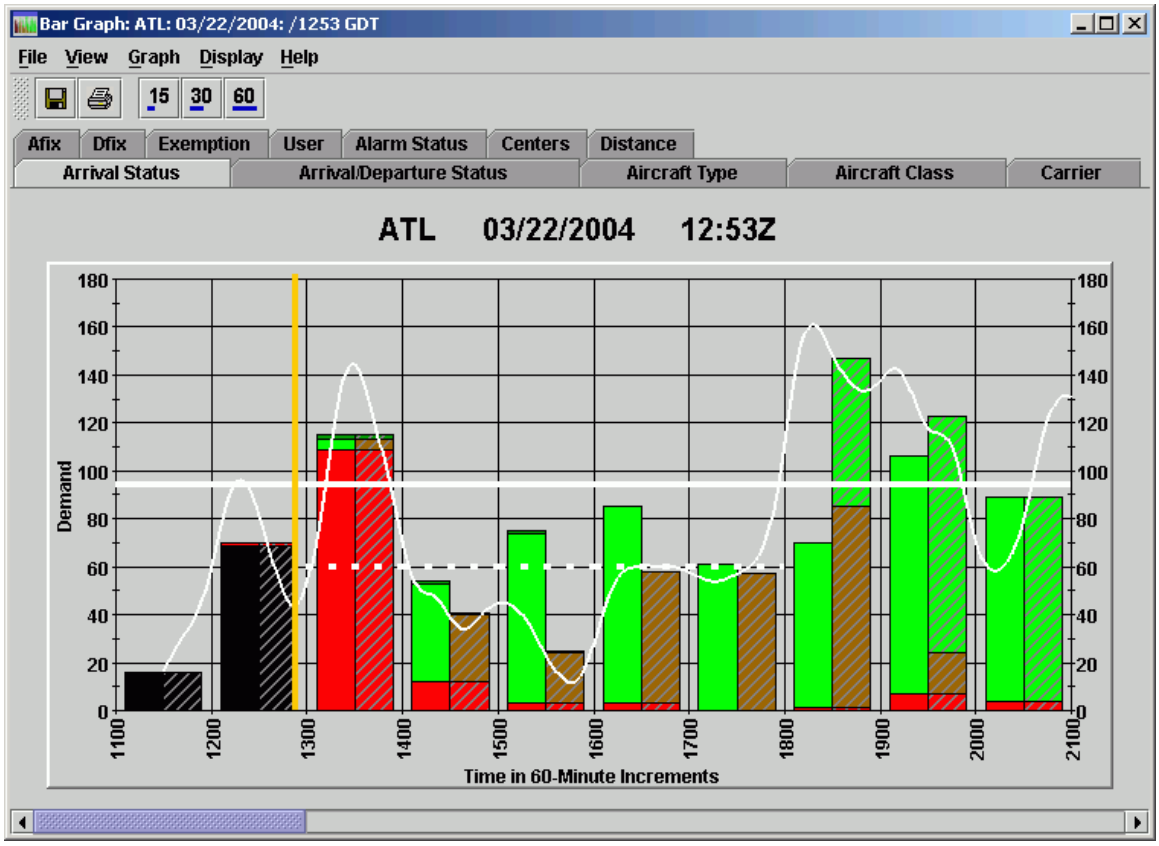

Figure 4-18: GDT Bar Graph Display

GDT Data Graph Component

The *GDT Data Graph* component is one of the four components that automatically opens when the **GDT Setup** button is selected from the *Control Panel* component. You have the option to review, or model your ground delay parameters before actually running the program or revising any parameters. Use the **Model** button on the *GDT Setup* component to view the initiative's results with your current parameters in the Data Graph. From the Power Run Tab on the *GDT Setup* component, you can choose the type of data you wish to view on the *Data Graph's* X-axis. When you click **Model** you can view the results of various scenarios. You have the option to change your parameters, analyze the program further, or if satisfied with the result, run the program (see Figure 4-19.

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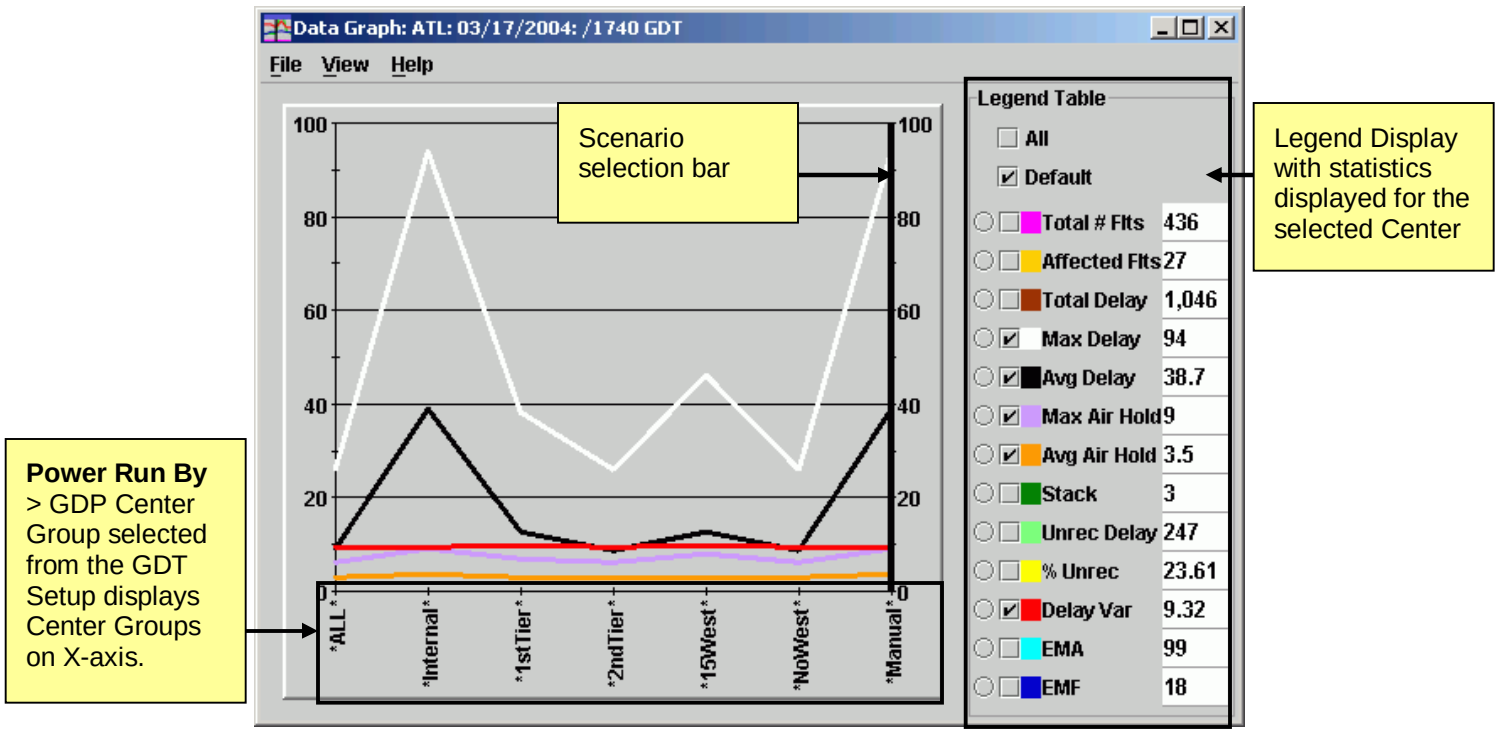

Figure 4-19: Data Graph Component

Selecting Different Scenarios

You can view all the available scenarios based on the Power Run selection from the *GDT Setup* component. For example, selecting **Power Run By** > *GDP Center Group* from the Power Run tab on the *GDT Setup* and then pressing **Model,** displays all the available tiers for the monitored airport on the *Data Graph* component's X-axis. Using your mouse, drag the black vertical line to the desired center group, or just click the mouse over the desired center group, to move the line. The delay statistics to the right of the *Data Graph* reflect the line of scenario delineation. In addition, changing the center option will automatically update all GDT components to reflect the new parameters. The *Data Graph* component includes a mouse roll-over feature. Rolling your mouse over any line in the *Data Graph* will give you the delay statistics for the colored line that reflects the results of the center group. **Error! Reference source not found.** has the 2nd tier option selected with all the corresponding delay statistics in the legend. The mouse rollover is displaying an average delay of 74 minutes if a No West program was selected. From the *Data Graph*, it is easy to visualize what center groups will give the best results. For example, in the figure below it is easy to see either an ALL, 2nd Tier, or No West program will produce the best results.

Delay Statistics

The delay statistics are displayed within the Legend Table. By default the legend table is displayed when the *Data Graph* component is opened, you can hide the legend by un-checking the **View** > *Show Legend* box from the Data Graph Menu. In the Legend Table, there are several ways you can view a desired delay statistic. Checking the **All** checkbox

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will select and display all the delay statistics. Checking the **Default** checkbox will display the default delay statistics, which are Max Delay, Avg Delay, Max Air Hold, Avg Air Hold, and Delay Var. You can manually select/deselect any of the delay statistic checkboxes to be viewed in the Data Graph. To view one delay statistic in more detail, select the desired radio button option, located to the left of the checkboxes. The radio button option will display only one delay statistic at a time, but will give a more refined looked at the numbers. Delay Statistics included in the Data Graph:

- **Total # Flts:** The total number of flights included in the TMI (canceled and exempt flights) for each particular scenario. Default color is Pink.
- **Affected Flts:** The total number of delay that would occur if that particular scenario were run. Default color is light orange.
- **Total Delay:** The total amount of delay that would occur if the particular scenario were run. Default color is maroon.
- **Max Delay:** The maximum amount of delay (in minutes) that any one flight would receive if using the parameters the selected scenario. Default color is white.
- **Avg Delay:** The average amount of delay (in minutes) flights would receive if the parameters of a particular scenario were used. Default color is black.
- **Max Air Hold:** The maximum amount of airborne holding delay (in minutes) that would be placed on any one flight using the parameters of a selected scenario. Default color is lavender.
- **Avg Air Hold:** The average amount of airborne holding (in minutes) that would be placed on flights if the parameters of a particular scenario were used. Default color is orange.
- **Stack:** The amount of flights that would be left in the "stack" hour following the end of the initiative if the parameters of a particular scenario were used. Default color is hunter green.
- **Unrec Delay:** Unrecoverable delay is the amount of delay that will remain on flights even if you release the TMI right before the start time for the selected scenario. FSM determines this value by setting the time to the TMI start time and performing the release delay function. Default color is lime green.
- **% Unrec:** Percentage of Unrecoverable delay is a value that is calculated by taking the Unrecoverable Delay and dividing it by Total Delay (Unrecoverable Delay/Total Delay). This is the percentage of delay that will remain even if all delay is released at the start time for the selected scenario. Default color is yellow.
- **Delay Var:** Delay Variability is the standard deviation of the carriers' average delay. This value is determined by taking the average delay of all carriers to see if they are similar. If the average delay is similar for all carriers, the delay variability is a small value. Default color is red.
- **EMA:** The Equity Metric for Airlines is a metric that indicates (as a whole) how equitable, or fair, the proposed initiative is for the airlines. Equity is determined by comparing the delay assigned in a proposed initiative to that which results using the

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airborne holding model, any deviation from the airborne holding model must be viewed as decreased equity. The values shown in this field are integers rounded from the calculated values. A value of 1 indicates that the initiative option results in delays are exactly the same as those for airborne holding. A value from 2 to 8 indicates an option that still exhibits good equity, though the one with the lower value is still preferred. A value from 9 to 16 indicates an option with increasingly significant deviation from the standard. A value above 16 indicates an option with poor equity. Default color is cyan.

- **EMF:** The Equity Metric for Flights is a metric that indicates (as a whole) how equitable, or fair, the proposed initiative is for all the flights. Equity is determined by comparing the delay assigned in a proposed initiative to that which results using the airborne holding model, any deviation from the airborne holding model must be viewed as decreasing equity. The values shown in this field are integers rounded from the calculated values. A value of 1 indicates that the initiative option results in delays are exactly the same as those for airborne holding. A value from 2 to 8 indicates an option that still exhibits good equity, though the one with the lower value is still preferred. A value from 9 to 16 indicates an option with increasingly significant deviation from the standard. A value above 16 indicates an option with poor equity. Default color is blue.

GDT Data Graph Menu

Figure 4-20: GDT Data Graph Menu

The menu bar (shown above) in the GDT *Data Graph* component contains three options: **File, View,** and **Help.**

1. **File Menu:**

File > *Save as* - Saves the *Data Graph* as a .jpg image in a directory that you specify.

File > *Print* - Prints the Data Graph that is currently active on your screen.

File > *Close* – Closes the Data Graph component only.

13. **View Menu:**

View > *Show Legend*- By default the checkbox is selected and the color legend of the delay statistics are displayed. Unselect the checkbox to hide the legend and the delay statistics.

14. **Help Menu:**

Help > *Data Graph* - Opens a web-based on-line help system.

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GDT Data Table Component

The *GDT Data Table* component is an optional component in GDT Mode. To open the GDT *Data Table*, select **View** > *Data Table* from the *GDT Setup* component menu bar. The *Data Table* is an exact representation of the *Data Graph*, but in tabular format (see Figure 4-21). The column headings display the same information that is displayed on the X-axis of the *Data Graph*, which is based on the Power Run selection type. The top scroll area displays the hours of the proposed initiative along with the current AAR for each hour. Under each heading, the [# of flight/Open Slots/Stack] values are displayed for each hour/heading combination. Below the Hour rows are the various statistics. You can sort the Delay Statistic rows by clicking on the statistic labels beneath the Program Hour rows. This will sort the best scenarios from left to right for the selected statistic.

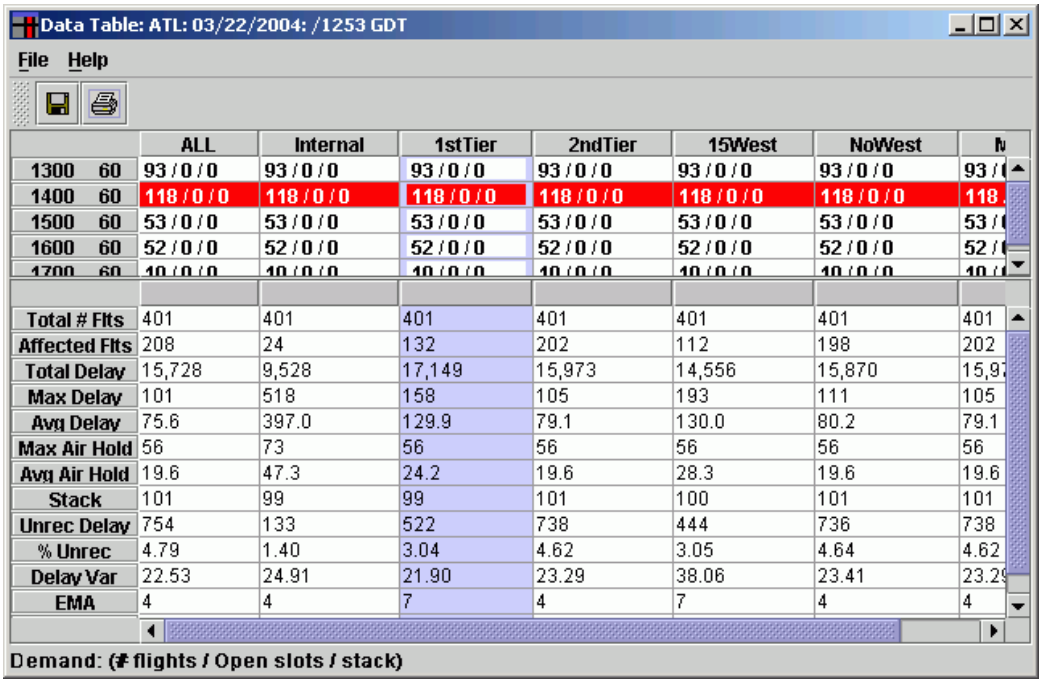

Figure 4-21: Data Table Component

The *Data Table* component and the *Data Graph* Component are dynamically interactive. You may move the model line in the *Data Graph* component and the *Data Graph* will highlight the corresponding column or you can select a column header from the *Data Table* to dynamically move the selection line in the *Data Graph*.

Figure 4-22 illustrates how both the *Data Graph* and *Data Table* display the same statistics but in different formats.

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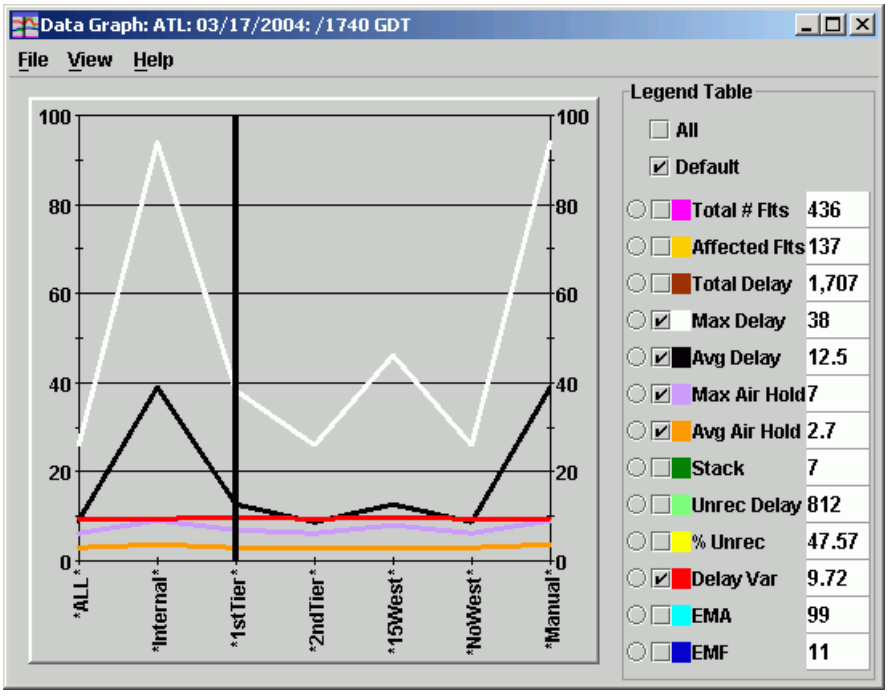

Figure 4-22: Data Graph Reflected the Data Table selection for 1st Tier

GDT Data Table Menu

Figure 4-23: Data Table Component Menu Bar

The menu bar in the GDT Data Graph component contains three options: File, View, and Help.

1. **File Menu:**

File > *Save as* - Saves the *Data Table* as a .jpg image in a directory that you specify.

File > *Print* - Prints the *Data Table* that is currently active on your screen.

File > *Close* – Closes the *Data Table* component only.

15. **Help Menu:**

Help > *Data Table* - Opens a web-based on-line help for the *Data Table* component.

GDT Time Line Component

The *GDT Time Line* component is an optional component in GDT Mode. To open the *GDT Time line*, select **View** > *Time Line* from the *GDT Setup* component menu bar. The *Time Line* in GDT Mode is almost identical to the Time Line in Monitor (Live) Mode. There are two differences to the *GDT Time Line* that should be noted: First, only arrival

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data is used in GDT Mode, the *GDT Time Line* only displays arriving flights where as the *Live Time Line* can display both arrival and departure data. . The **View** > *Departure Data* option that is found in the *Live Time Line* is not an option in GDT Mode. Second, there is an extra menu option, **Display**, available in the *GDT Time Line.* The **Display** Menu option contains 6 additional radio button choices of how you can view flights in the *GDT Time Line* component, shown in Figure 4-24 below.

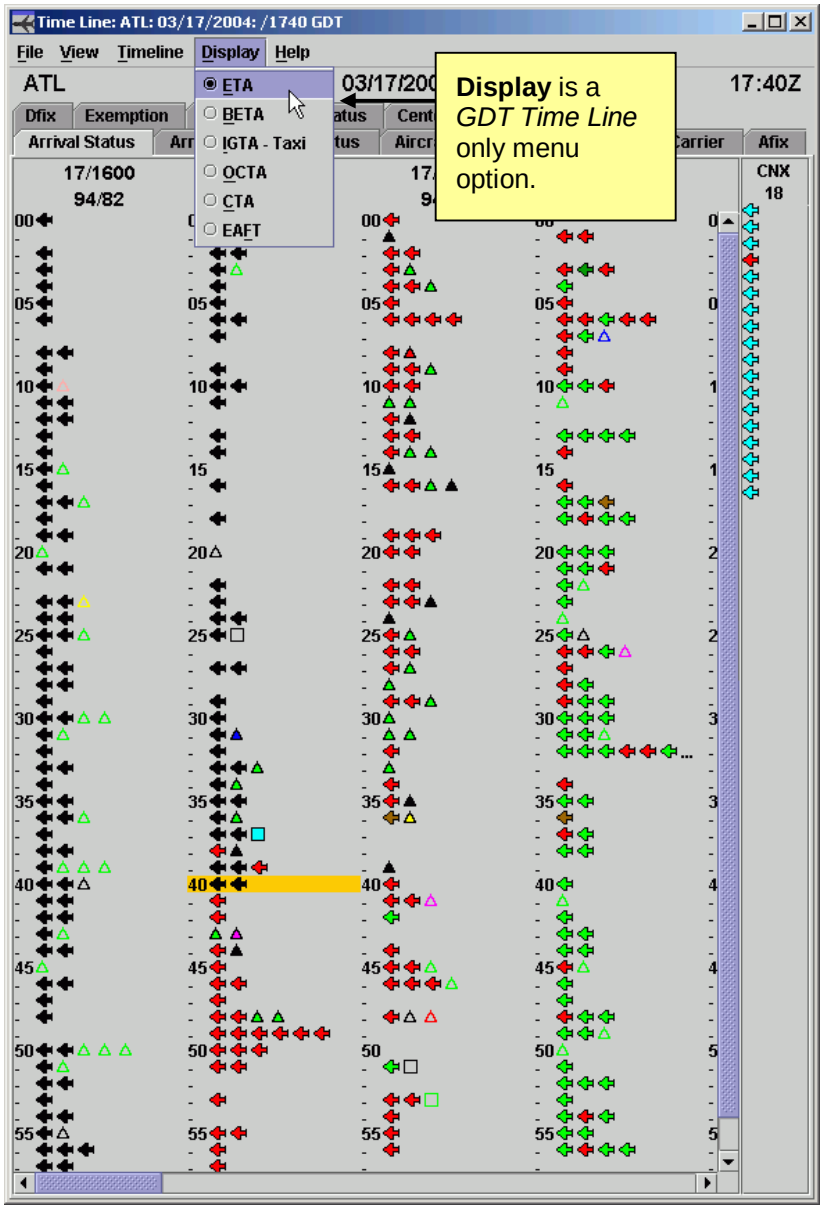

Figure 4-24: GDT Time Line Component

You can display the flights in the *Time Line* based various ADL arrival data fields. By default, the *GDT Time Line* is displayed based on ETA.

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GDT Time Line Menu Bar

Figure 4-25: GDT Time Line Component Menu Bar

The menu bar in the *GDT Time Line* component contains five options: **File, View, Time Line, Display** and **Help**.

1. **File Menu:**

File > *Save as* - Saves the *Time Line* as a .jpg image in a directory that you specify.

File > *Print* - Prints the *Time Line* that is currently viewed on your screen.

File > *Close* - Shuts down the *Time Line* component for that particular airport.

2. **View Menu:**

View > *Rename Window…*- Displays the Rename Window dialog box and allows you to change the component name in the title bar. Enter your desired component name then press **OK** to change the title bar heading as shown in Figure 4-26 below.. Press **Cancel** to close the Rename Window dialog box without making any changes.

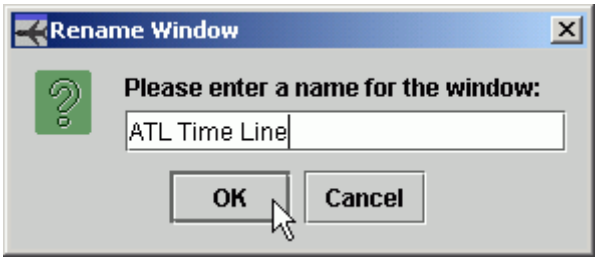

Figure 4-26: Rename Window

There are four checkboxes for additional display options to choose from under the **View** menu. To select the information, the checkbox must be marked.

View > *Show Cancellations* - Displays all canceled flights under the CNX column to the right of the active flight information.

View > *Show Color Legend* - Displays the appropriate color legend associated with the current view.

View > *Open Slots in Carrier Color* - Displays all open slots due to either cancellations or delayed flights in the associated carriers color.

View > *Auto Icons* - Displays the flights in the TSD icon format. The TSD format displays different icons based on the flight aircraft weight. When *Auto Icons* is unchecked, the classic FSM Time Line icons are displayed, which display the same icon for all aircraft weights.

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Classic View	New (TSD) Icon Format	Description
		Jet
		Heavy
		Prop (Includes Turbo and Piston)

To view more detailed information about a individual flight or group of flights, select a flight icon from the Time Line or select a group of flight by using the CTRL key and then either right-click to view a popup window with the Flight Info, Flight Details, or Flight List options or select the desired information to display from the **View** menu.

View > *Flight Info* - Displays the Flight Info window for a quick reference on the flight.

View > *Flight Details* - Displays the Flight Details window for more in depth information on the flight.

View > *Flight List* - Displays the FSM Flight List window. This feature will be available in FSM version 7.8.

Note: View > *Show Cancellations* and *Open Slots in Carrier Color* checkboxes are selected by default.

3. **Time Line Menu**:

Time Line > *Track Time* – This checkbox allows you to turn *Track Time* on/off by selecting or deselecting the *Track Time* checkbox option. To force the Time Line to update when the current hour changes, checkmark the *Track Time* box under the Time Line and when the hour changes, the Time Line will move forward, one hour. If the *Track Time* box is not selected, you can scroll forward or back in time and at the next update time the Time Line will not return to the current time.

Time Line > *Set Time* – This option is only an available under Historical Data Mode and allows you to designate which time to view within a set of historical data.

Time Line > *Search Flight by Call Sign* - Allows you to find a particular flight by entering the flight's call-sign and origin airport. The flight in the *GDT Time Line* is then surrounded by a white, wire-framed box as shown in Figure 4-27 .

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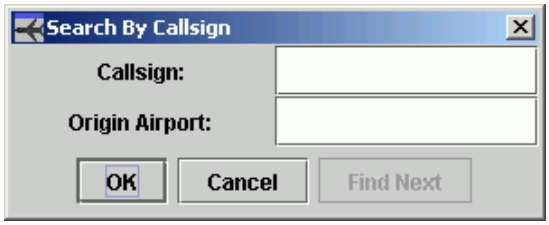

Figure 4-27: Search By Call Sign

4. Display Menu:

Display > *ETA*: Display flights based on their Estimated Time of Arrival (ETA).

Display > *BETA:* Displays flights based on their Base Estimated Time of Arrival. The BETA matched the ETA and gets frozen when the flight becomes active or when the flight becomes controlled.

Display > *IGTA – taxi*: Displays flights based on their Initial Gate Time of Arrival minus taxi time. The IGTA is based on the OAG times or flight plan times and never changes.

Display > *OCTA:* Displays flights based on their Original Controlled Times of Arrival. This time never changes.

Display > *CTA***:** Displays flights based on their current Controlled Time of Arrival.

Display > *EAFT:* Displays flights based on their Estimated Arrival Fix Time.

5. **Help Menu:**

Help > *Time Line* - Displays the web-based on-line help for the *GDT Time Line* component.

Help > *Legend* - Displays the Time Line icon legend.

Table 4-1: Time Line Legend

Time Line Icon	Description
	Indicated the latest or current ADL file data update time in the Time Line component.
	A flight arriving at the monitored airport by ETA in the *Time Line* component and colored by the current color scheme.
	An open slot due to a cancelled flight, which is included in a GDP. It is positioned at its arrival slot time and is colored by carrier.
	An open slot due to a cancelled flight, which is not included in a GDP. It is positioned at its (IGTA-taxi) and colored by carrier.

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Time Line Icon	Description
	An open slot due to a delayed flight that is included in the GDP. It is positioned at its arrival slot time and colored by carrier. The corresponding flight is positioned at a later time matching the ETA.
	An open slot due to a delayed flight that is not included in the GDP. It is positioned at its (IGTA – taxi) and colored by carrier. The corresponding flight is positioned at a later time matching the ETA

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5 Opening FSM

Introduction

The main *Control Panel* component, shown below, is the first component displayed when you start the FSM application. FSM can be opened in three different data modes:

1. **Monitored Live –** Used to monitor airports in real-time.
2. **Historical –** Used to view, recall or analyze previous airport air traffic events.
3. **GDT-** Used to model, analyze, and/or create Traffic Management Initiatives (TMIs) for airports depending on air traffic variables.

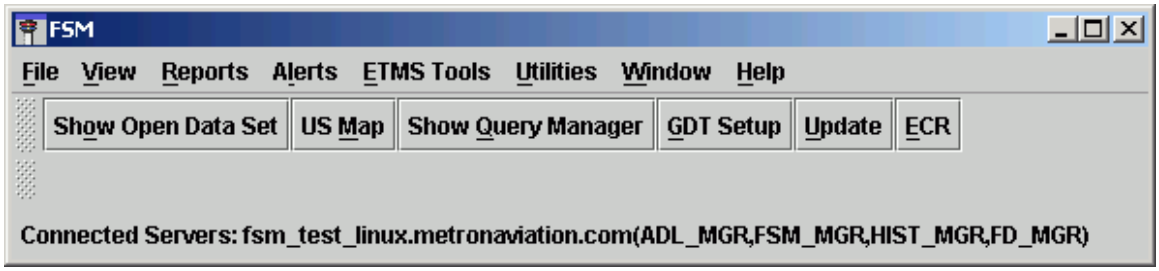

Figure 5-1: Main Control Panel Component

Opening an Airport

Click the **Show Open Data Set** button on the main *Control Panel* component to open the *Open Data Set* Component. The *Open Data Set* component will display four data Tabs that are used to access both Live and Historical data. The four Tabs available in the *Open Data Set* components are listed below and shown in Figure 5-2:

1. **Monitored Live -** The Monitor Live Tab provides a list of airports currently monitored by the FSM server and readily available for viewing by the user. Live data mode runs real-time data and receives ADL updates approximately every 5 minutes.
2. **Historical –** The Historical Tab displays historical data that has been stored in a database. Historical data can be recalled to analyze scenarios or replay a day's air traffic events.
3. **All Live -** The All Live Tab provides a list of airports that can be viewed by the user (not on the server but will only take a minute to bring up).
4. **Active Historical -** The Active Historical Tab provides a list of historical airport data currently opened and monitored by the user.

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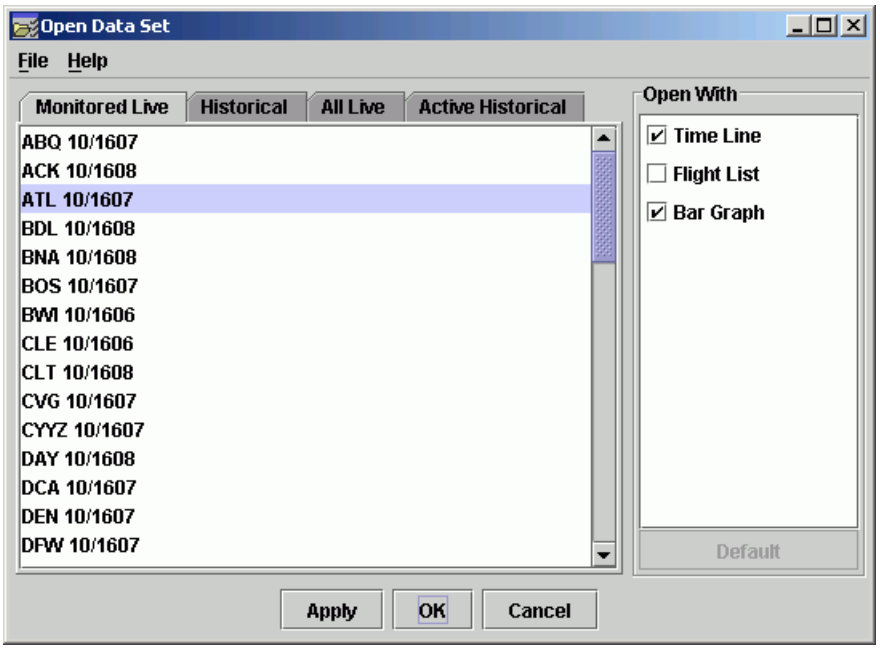

Figure 5-2: Open Data Set Component

To open an airport you must select a Data mode, Data set, and choose the display components to view the information.

- **Data Mode:** From the *Open Data Set* Component you can open an airport in either Live or Historical Data modes. To open an airport in Live Data mode, use either the Monitored Live or All Live Data Tabs. To open an airport in Historical Data mode, use either the Historical or Active Historical (if you have already opened an airport in historical mode) Data Tabs. GDT mode is accessed from the **GDT Setup** button on the *Control Panel*.
- **Data Set:** The Data set is the airport you wish to view. When opening an airport in Historical Data mode, the Data set will also include the date and time (optional).
- **Display Components:** From the Open With selection box you have the option to open data sets in three components: *Time Line, Flight List,* or *Bar Graph* components. By default, both *Time Line* and *Bar Graph* components are selected.

Note: When speaking of FSM, "Window," "Screen", "Display", and "Component" are used interchangeably throughout the manual. They refer to the particular display at which you are looking.

Opening FSM in Monitored Live Mode

Monitored Live Tab

From the *Open Data Set* component, you can open FSM in Monitored Live mode. The **Monitored Live** Tab is in focus when the *Open Data Set* component is initially opened

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and provides a list of airports currently monitored by the FSM server readily available for viewing.

Select the desired Data set (airport) by double clicking the airport or selecting the airport from the scroll box and then clicking **Apply** or **OK** to display the Data set in the components that are selected in the **Open With** box**.** Double clicking an airport or selecting the airport and then pressing **Apply** will leave the *Open Data Set* component open. Selecting the airport and then clicking **OK** will open the airport in the selected components but will close the *Open Data Set* window. By default, both *Time Line* and *Bar Graph* components will be displayed if no change has been made in the **Open With** component selections. To view the Flight List for an airport, mark the Flight List checkbox in the **Open With** selection box before opening the Data set. Alternatively, if you do not wish to view the data set in both the *Time Line* and *Bar Graph*, you can unselect the checkboxes before opening the Data set.

> **Note:** If an airport currently has a GDP or GS in place, the *Open Data Set* component will display "GDP ACTUAL" or "GS Actual" followed by the date and times of the TMI next to the airport.

Figure 5-3 shows ATL airport selected with the *Time Line* and *Bar Graph* components check marked in the **Open With** selection box. This will open the *Time Li*ne and *Bar Graph* components for ATL in Live Data mode.

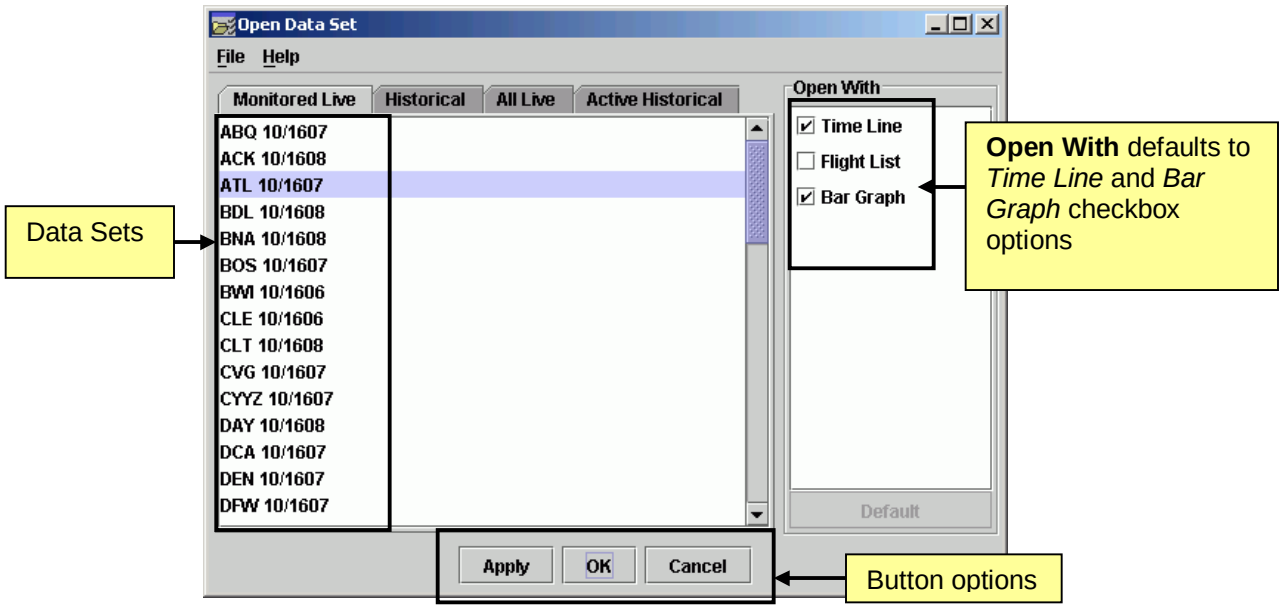

Figure 5-3: Monitored Live Tab

Figure 5-4 shows FSM opened in Monitor Mode (Live) for ATL.

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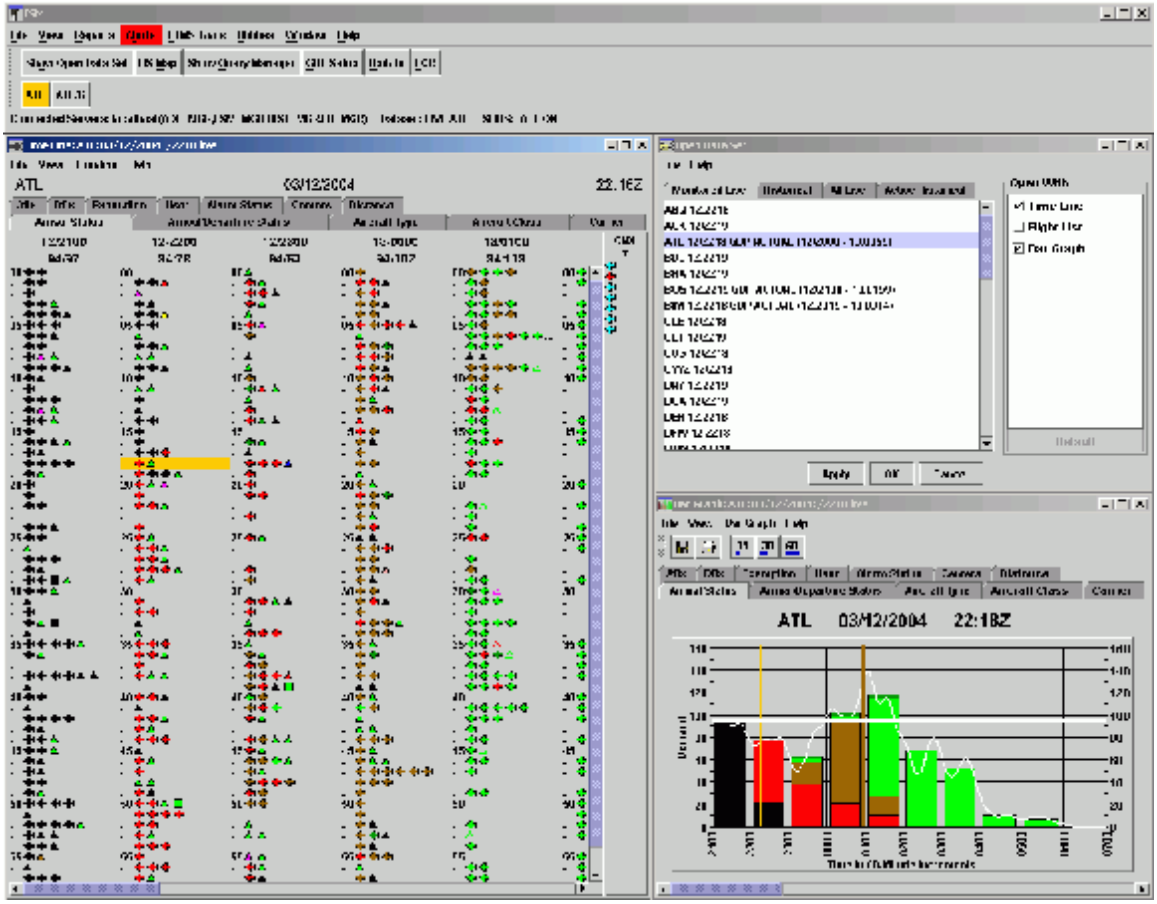

Figure 5-4: Data Set ATL opened in Monitored Live Mode

Using the US Map to Open Components in Monitored Live

Click the **US Map** button on the *Control Panel* component to view all the airports currently being monitored on the *US Map.*

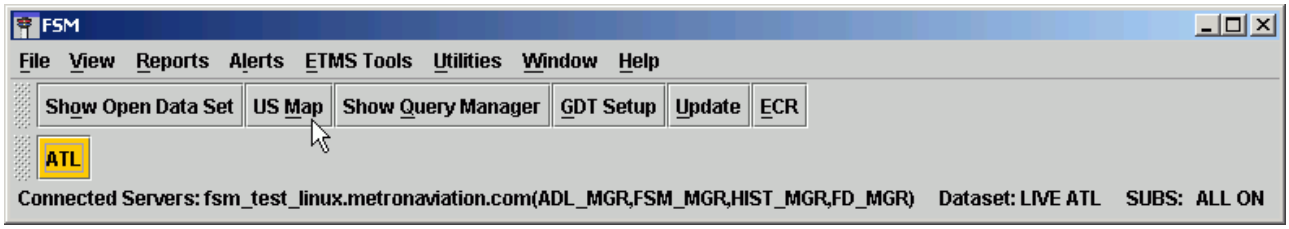

Figure 5-5: US Map Button

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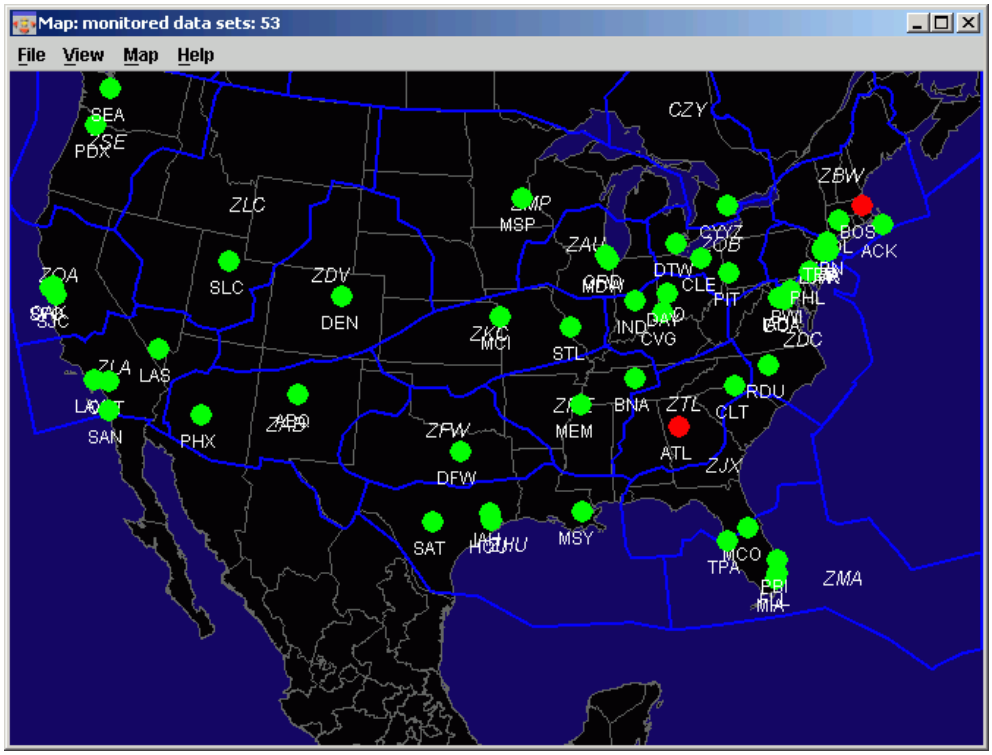

Figure 5-6: US Map Component

Figure 5-6 shows green airports that indicate normal operations, while red airport indicate that there is an actual TMI. Yellow airports indicate there is a proposed TMI. To open a data set from the *US Map* component, click on the airport you wish to open. The selected airport will turn white and display the three-letter airport ID followed by the current ADL time (ddhhmm) for that airport. If you select an airport with actual or proposed parameters in place, the airport's parameters will be graphically displayed (see Figure 5-7). Right-clicking a selected airport displays a pop-up option menu. Select the desired component you wish to view the airport with: *Time Line, Bar Graph,* or *Flight List* component (see Figure 5-8). Only one component can be opened at a time from the *US Map*.

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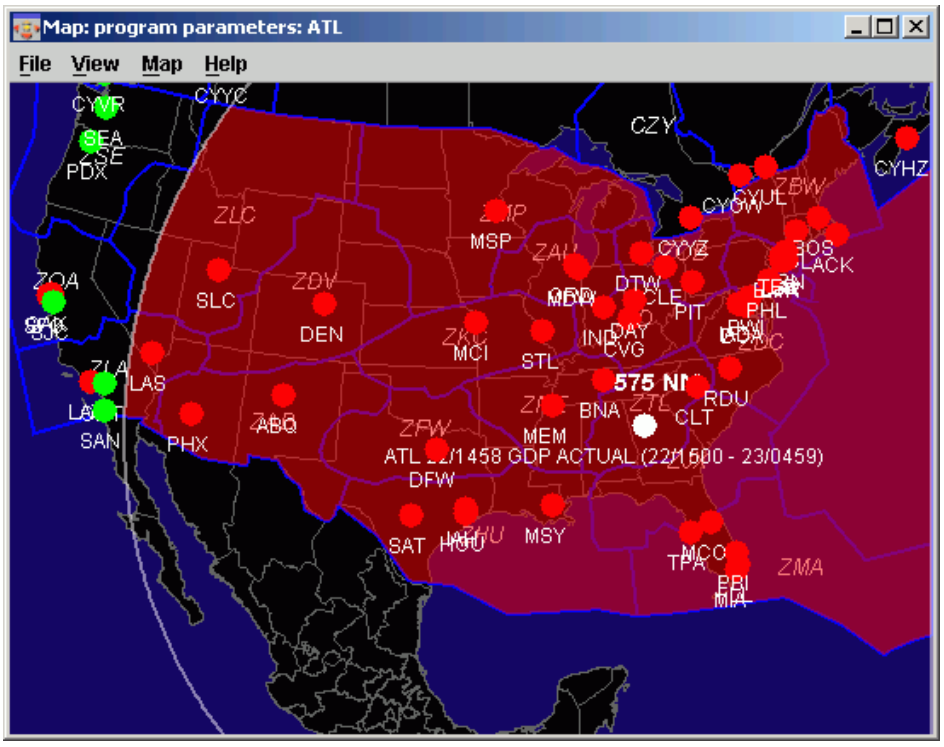

Figure 5-7: Selected Airport turns White

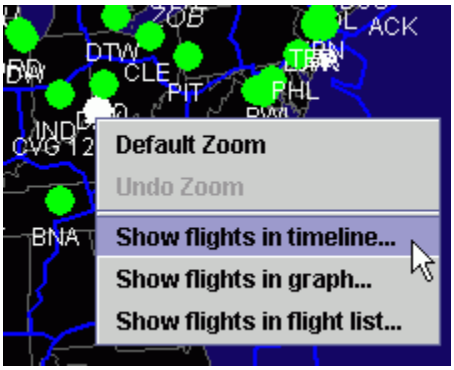

Figure 5-8: Opening Components from the *US Map*

Note: Only Monitored Live mode can be opened from the *US Map* component.

Opening FSM in Historical Mode

Historical Data Tab

The **Historical** Tab on the *Open Data Set* component opens archived data that can be used to review and analyze past airport events. The *Open Data Set* component will default to the **Monitored Live** Tab when initially opened. Click on the **Historical** Tab to

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view archived data. You can drill down to the desired Data set by clicking on the drill down icons or by double-clicking the file name.

Historical file structure is organized as follows: Server, Year, Month, Day and Airport.

> **Note**: If there are multiple servers that the client is connected to, both servers will be listed.

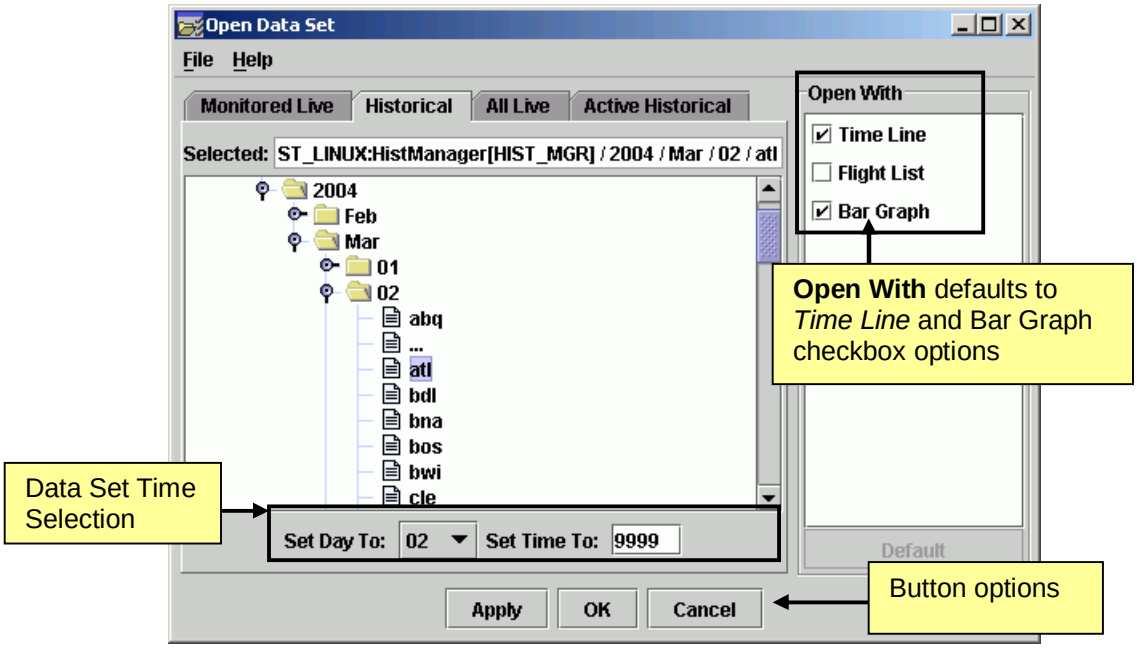

Figure 5-9: Historical Tab

Identical to opening FSM in Monitored Live mode, *Time Line* and *Bar Graph* components are opened by default for the selected Data set. The *Flight List* component will not open unless you select the corresponding checkbox in the **Open With** selection box. Once the desired Data set is selected, you have the option to set the Data time before opening FSM. When a Data time has been specified, the components will open the ADL data time closest to, but not after, the specified time.

> **Note:** All times displayed in and used by FSM are Zulu times unless otherwise specified.

There are several ways to open up the Data set after the desired airport, components, and data time have been selected. Double clicking on a desired airport or pressing the **Apply** button will open the historical mode data and leave the *Open Data Set* component open. Clicking the **OK** button will also open the historical mode data in FSM, but will close the *Open Data Set* component.

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Begin Monitoring an Airport

All Live Tab

The **All Live** Tab on the *Open Data Set* component provides a list of airports that are not currently being monitored by the server but are readily available for viewing (see Figure 5-10).

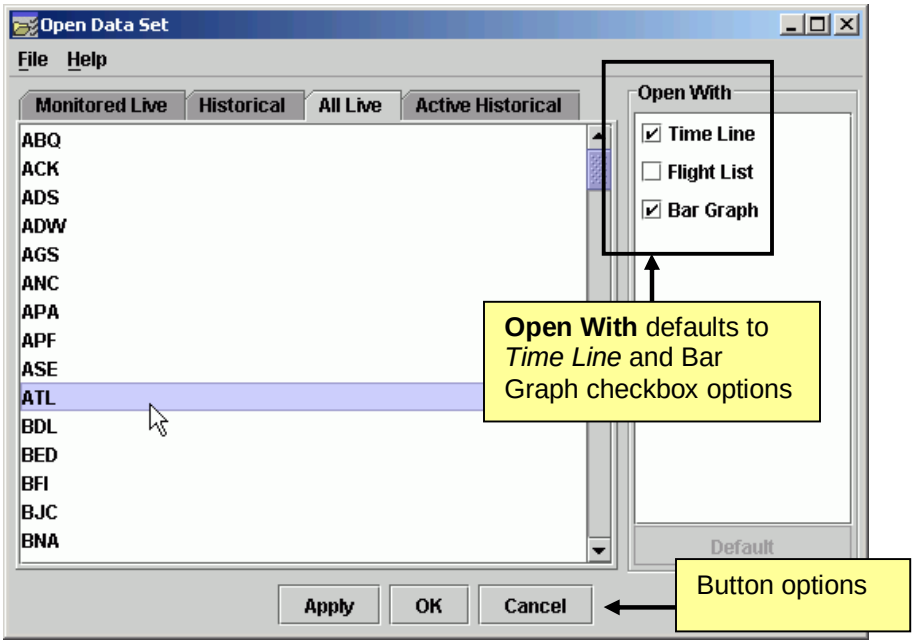

Figure 5-10: All Live Tab

To begin monitoring an airport, double-click an airport or select the airport and click **Apply** or **OK** to open the airport with the components selected in the **Open With** selection box. Double-clicking or using **Apply** will leave the *Open Data Set* component open. Click **OK** if you wish to open the selected airport, but close the *Open Data Set* component. The **All Live** Tab opens airports in Live mode only. Opening an airport from the **All Live** Tab may take a few moments longer than opening an airport from the **Monitored Live** Tab and an FSM Information message may appear to indicate the airport will take a moment to collect the first set of data (see Figure 5-11). Click **OK** to close the FSM Information message. After opening an airport from the **All Live** Tab, the airport will also be placed on the **Monitored Live** tab.

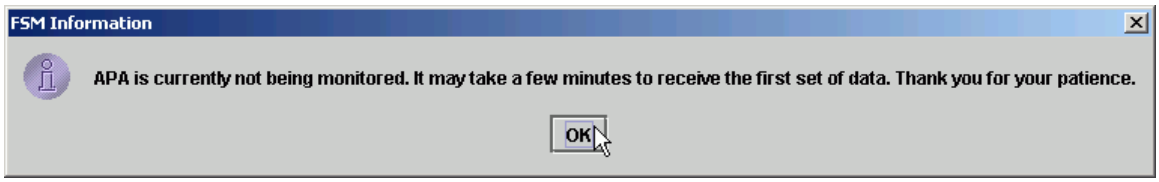

Figure 5-11: FSM information message

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Managing Historical Data

Active Historical Tab

The **Active Historical** Tab on the *Open Data Set* component provides a list of opened Historical data being viewed and monitored by the user. The **Active Historical** Tab will have an empty display window unless you have already opened a Data set from the **Historical** Tab.

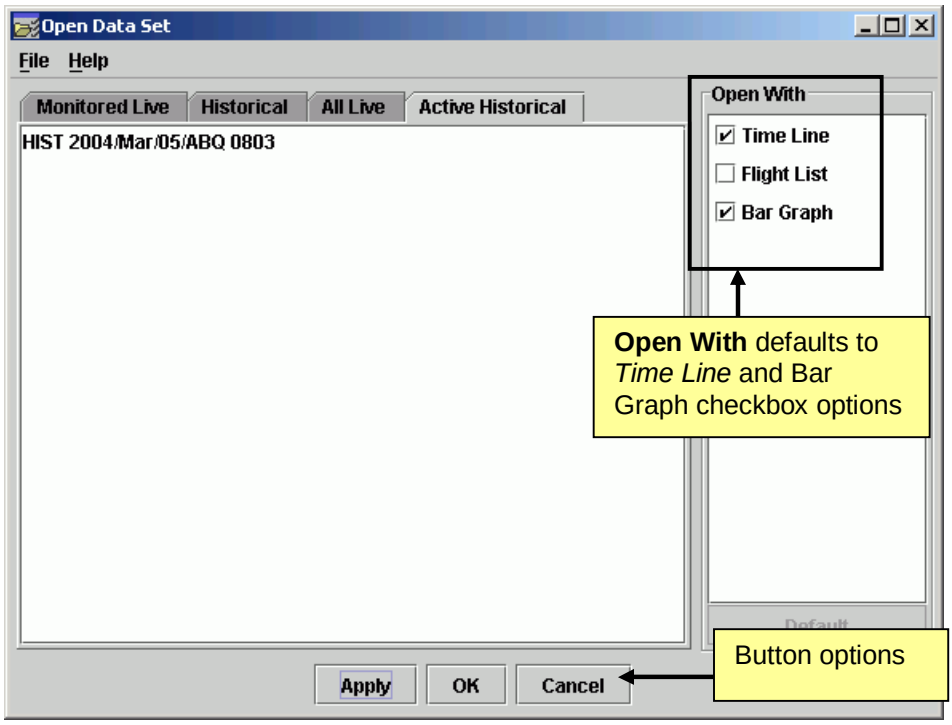

Figure 5-12: Active Historical Tab

To bring the historical data into focus, double-click the data set or select the desired data set and click **Apply** to open the airport with the components selected in the **Open With** airport selection box. Double-clicking or using **Apply** will leave the *Open Data Set* component open. Click **OK** if you wish to open the selected airport in the selected components and close the *Open Data Set* component. The **Active Historical** Tab only opens airports in Historical mode that have already been opened.

Opening FSM in GDT Mode

To analyze air traffic management options and/or implement TMIs open FSM in Ground Delay Tools (GDT) Mode by first selecting an airport that is open in either Live or Historical mode and then clicking the **GDT Setup** button from the main *Control Panel* component.

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Figure 5-13: GDT Setup Button

Four GDT components are opened by default when GDT mode is opened as shown in Figure 5-14 below: *GDT Setup*, *GDT Map*, *GDT Data Graph*, and *GDT Bar Graph* components. Additional components can be opened from the *GDT Setup* component in GDT mode, such as *Flight List*, *Data Table*, and *Time Line* components. See Chapter 4, Ground Delay Tools Overview for more detail about individual GDT components.

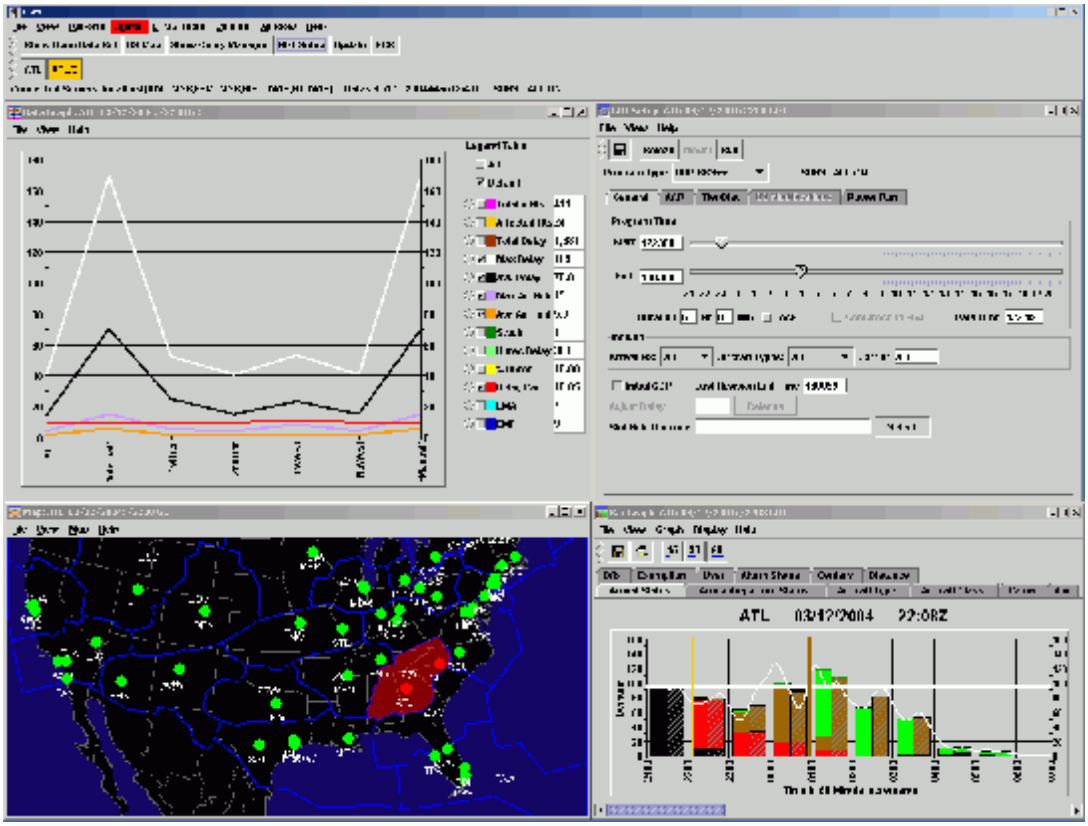

Figure 5-14: GDT Mode

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6 Viewing Flight Information

Introduction to Flight Data

FSM was developed to allow you to monitor flights arriving at and departing from an airport. You can view general traffic flow into an airport using several different components. The most obvious source to view a Data set is the FSM *Time Line* and *Bar Graph* components. As well as viewing the overall traffic flow of an airport, you can also access individual flight information using FSM. This chapter takes a look at the various ways that FSM allows you to view Data sets and flight information when making traffic management and operational decisions.

The FSM *Time Line* and *Bar Graph* components open by default to the Arrival Status Tab for the monitored airport that is opened. The Arrival Status Tab shows flights colored by arrival status in FSM. To view departure information, select the Arrival/Departure Status Tab in the FSM *Time Line* and/or *Bar Graph* components. FSM will display arrival and/or departure information depending on whether you select the Arrival and/or Departure Data checkboxes from the **View** menu.

Mouse Roll-Over Events

The mouse roll-over feature is active in the monitor mode *Time Line*, *Bar Graph*, and the GDT mode *Data Graph* components. Where available, rolling your mouse over various features will give you additional pop-up information.

1. **Time Line –** By rolling your mouse over a flight icon, a pop-up window will display the flight's ACID, ORIG, DEST, ETD, and ETA. See Figure 6-1 below.

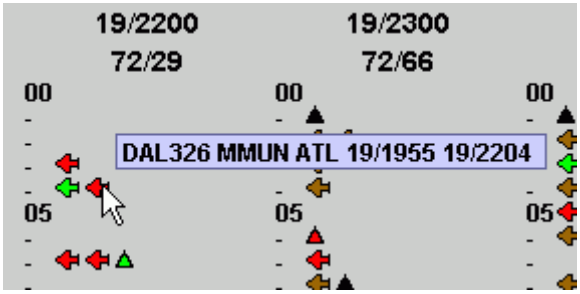

Figure 6-1: Rollover Flight Icons in the *Time Line* Component

2. **Bar Graph –** To view a flight count for any hour, roll your mouse over any bar within the *Bar Graph* and the respective number of flights will appear for the status color your mouse is over as shown in Figure 6-2. When you bring the mouse to the top of each column the total number of flights for that column or hour will appear in the *Bar Graph*. If you scroll the mouse near the top of a bar, the total number of flights for that hour will appear. The same method can be used to find the set Airport Arrival Rate (AAR). Scroll the mouse over the AAR and the rate will appear.

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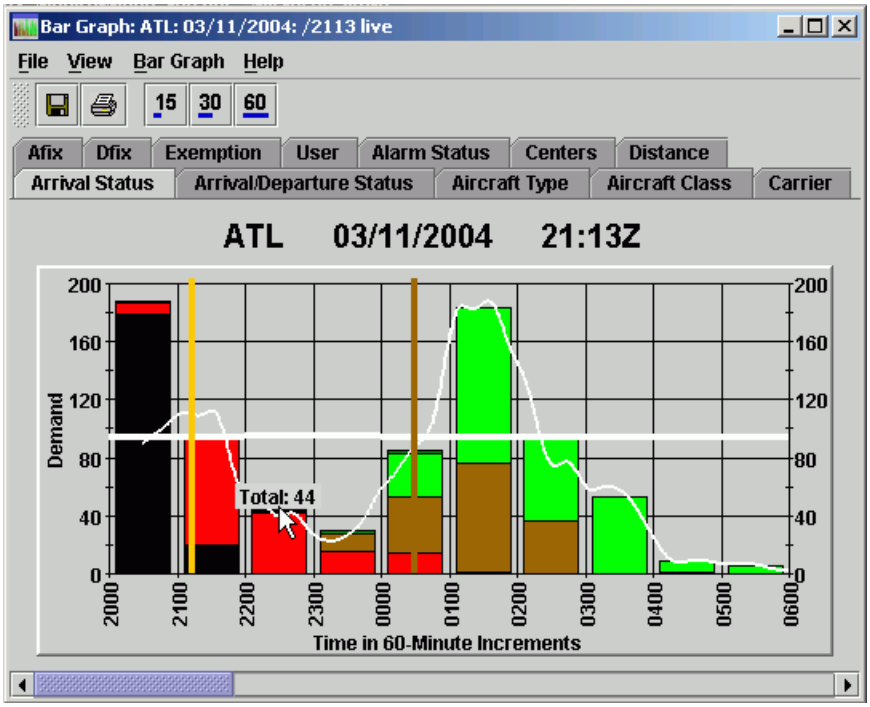

Figure 6-2: Bar Graph Count Rollover

3. **GDT Data Graph –**Rolling your mouse over any line in the *Data Graph* will give you the delay statistic count for the colored line that reflects the selected criteria of the scenario being monitored or modeled. Figure 6-3 illustrates the 2nd tier option selected with all the corresponding delay statistics in the legend and the mouse roll-over displays a maximum delay of 246 minutes if a 1st Tier program is selected.

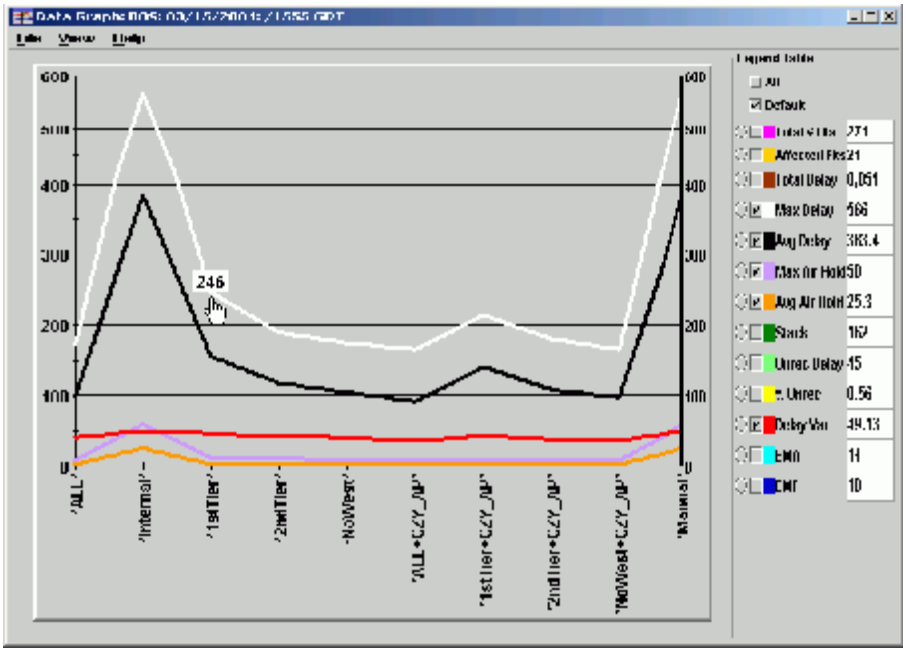

Figure 6-3: Data Graph Delay Statistic Rollover

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Right-Click Capabilities

The right-click feature is active in *Time Line*, *Status M*ap, GDT *Data Graph*, and *GDT Setup* components.

1. **Time Line** – Right clicking on a flight icon in the *Time Line* will give you five additional options for that flight: *View flight info, View flight details, EDCT Check EDCT Update, and ECR* as shown below.

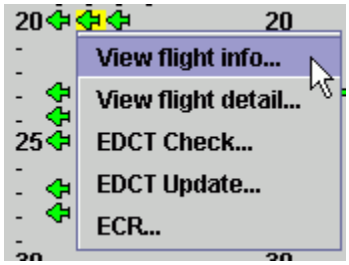

Figure 6-4: Time Line Right-Click Feature

Selecting *View flight info* displays the Flight Info panel (see Figure 6-5), which contains some general ADL information for a flight, including ADID, status, origin airport, destination airport, ETD, ETE, ETA, CTD, CTA, Delay Flag, and Cancel Flag when applicable. Double clicking on a flight icon in the *Time Line* will also open the flight's Flight Info window.

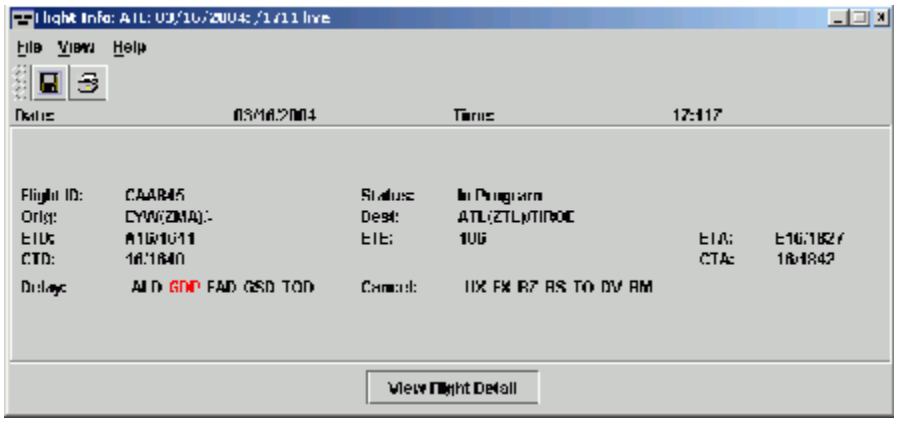

Figure 6-5: Flight Info Window

Selecting *View flight detail* displays the Flight Detail window as shown in Figure 6-6. The Flight Detail window contains all the ADL information for that flight. The user may also access the Flight Detail window by selecting the **View Flight Detail** button at the bottom of the Flight Info window.

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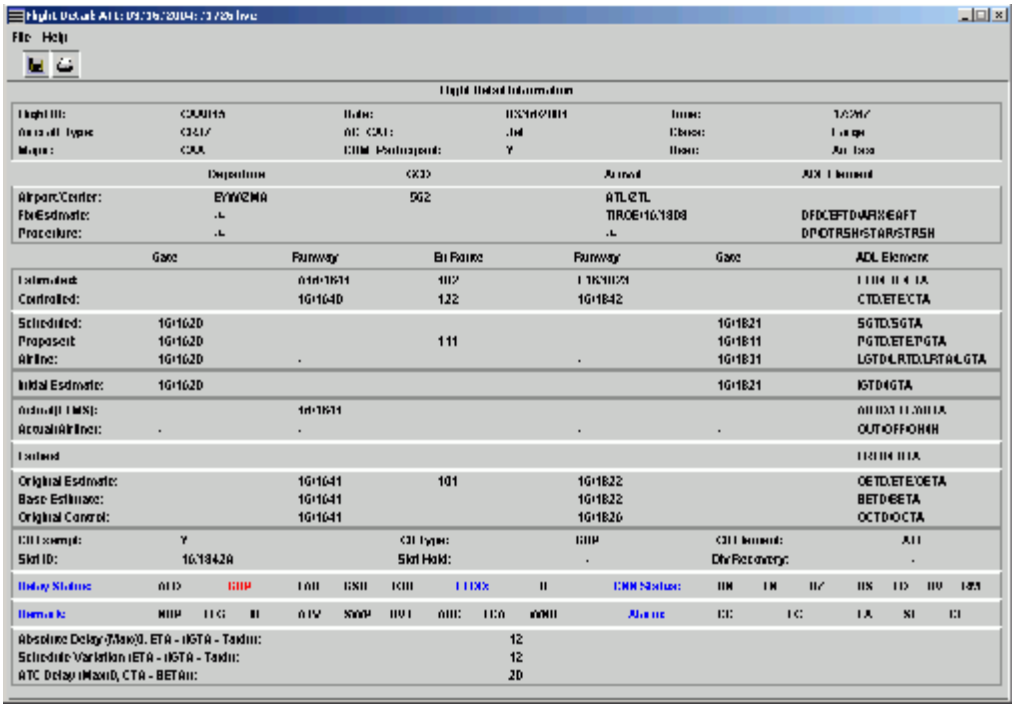

Figure 6-6: Flight Detail Window

Selecting *EDCT Check* or *EDCT Update* displays the EDCT Check or EDCT Update windows. These EDCT widows allow you to check a flight's EDCT or Update a flight's EDCT.

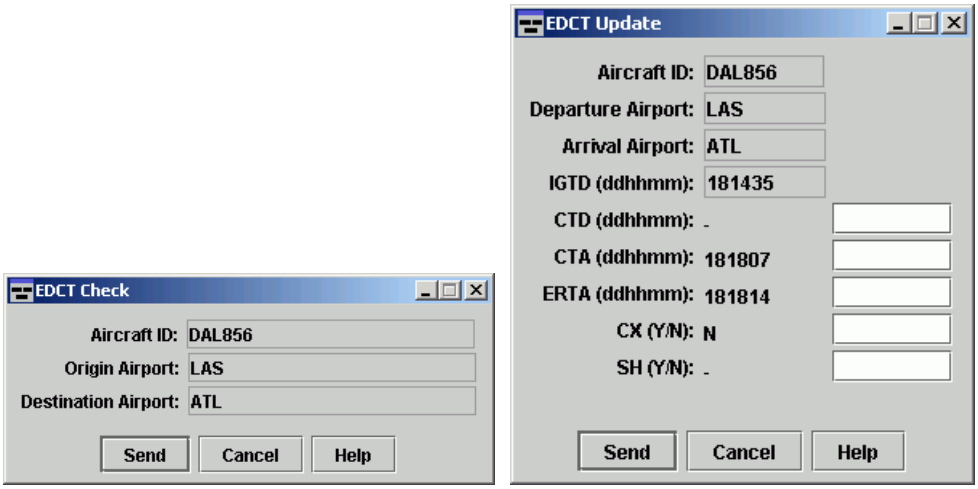

Figure 6-7EDCT Check and Update Windows

Note: The EDCT Check and EDCT Update options are only available for specialists at the ATCSCC.

Selecting *ECR* displays the EDCT Change Request (ECR) component. If the selected flight from the time is a controlled flight, the flight information will

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automatically be filled in the ECR window. Refer to <ECR chapter> for more information.

2. **US Map –** Right-clicking the mouse anywhere within the *US Map* component will give you two options: Default Zoom or Undo Zoom. Default zoom will take you back to the initial or default zoom setting for the Map. Undo zoom, will undo the last zoom command, same as using the X quick key. The GDT Map right-click functionality is the same as the US Map.

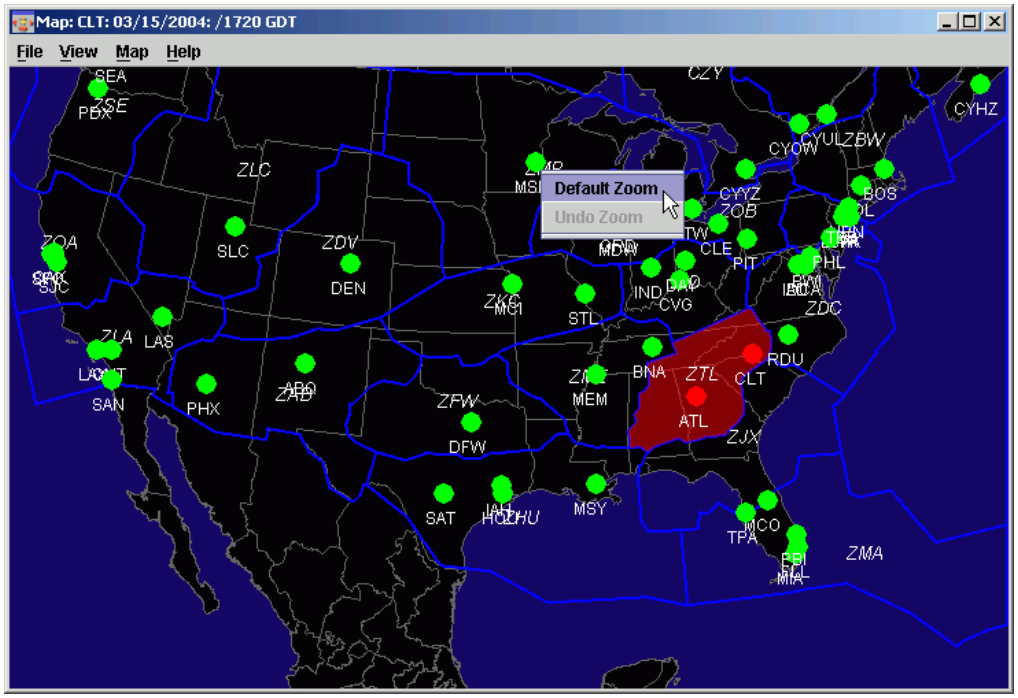

Figure 6-8: GDT Map Right-click zoom pop-up

In addition, after an airport is selected on the *US Map*, you can right-click on the selected airport to view more options to open the airport in other components. You have the option of Show flights in *Time Line, Bar Graph*, or *Flight List* components (see Figure 6-9). Only one component can be opened at a time from the *US Map* component.

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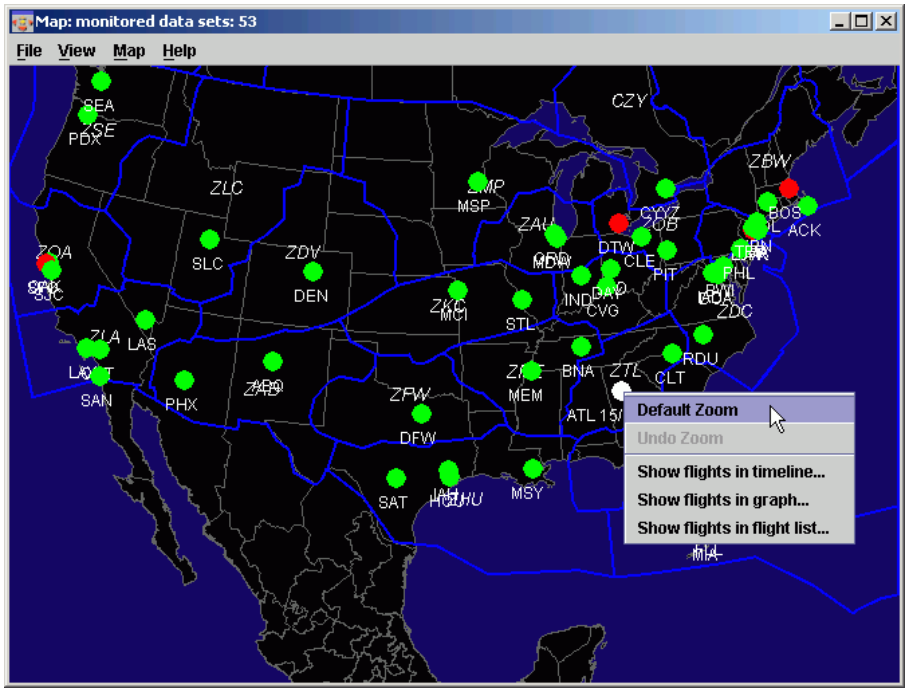

Figure 6-9: US Map Right-Click selected airport

FSM Flight Coloring

Display information by Flight color is a feature in FSM that assists the user to distinguish between the varying status of multiple flights. Flight color options are displayed as tabs on the *Time Line* and *Bar Graph* components in all Data modes. The following 12 coloring options are available in FSM.

1. Arrival Status
2. Arrival/Departure
3. Centers
4. Aircraft Type
5. Aircraft Class
6. Carrier
7. Arrival Fix
8. Departure Fix
9. Exemption Status
10. User
11. Alarm Status
12. Distance

The following sections provide a brief description the 12 coloring options. The coloring schemes are documented based on FSM's default settings. All coloring schemes can be configured by the user. Within the components you can select ***View*** > *Show Legend* or press CTRL + L at any time to display the color legend associated with the color Tab in

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focus (see Figure 6-10). Cancelled flights can be viewed by selecting ***View*** > *Show Cancellations* or pressing CTRL + C on your keyboard. Cancelled flights are colored Cyan. The examples below will display the *Bar Graph* component, but the *Time Line* component works in a similar manner.

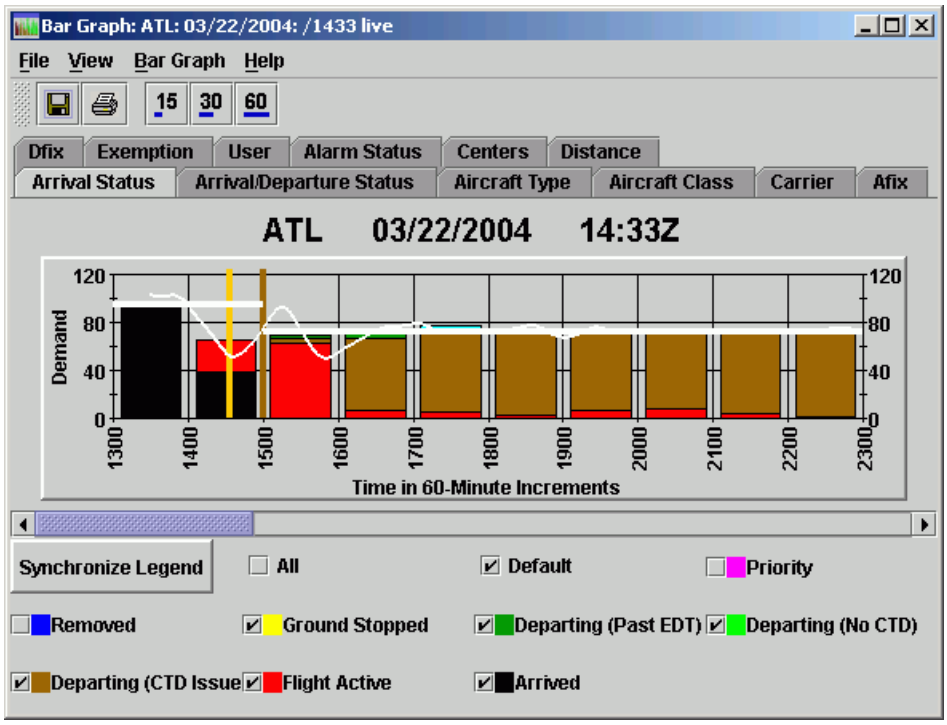

Figure 6-10: Bar Graph with Legend

Color By Arrival Status

The **Arrival Status** Tab colors flights in the *Time Line* and *Bar Graph* according to their arrival status at their destination airport. If you do not wish to view a particular status in the *Bar graph* or *Time Line* you can de-select that status color checkbox in the legend, and the component will not display the color associated with that status. The status data will remain grayed-out until the user selects the check box again to restore the status color back to the graph (see Figure 6-11).

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Figure 6-11: Bar Graph with departing flights not displayed

Table 6-1 displays FSM default coloring for Arrival Status.

Table 6-1: Arrival Status Tab Coloring

Flight Status	Definition	Default Color
Departing (No CTD)	Flights waiting to take off without delay. No Estimated Departure Clearance Time issued.	Light Green
Departing (CTD Issued)	Waiting to take off without delay. Estimated Departure Clearance Time has been issued.	Brown
Departing (Past EDT)	Flights which have passed their Estimated Departure Time and remain on the ground.	Dark Green
Arrived	Flights have arrived at their destination airport.	Black
Flight Active	Flights currently en route to their destination airport.t	Red
Cancelled	Flights that will not fly because they are cancelled.	Cyan
Ground Stopped	The flight is currently in a Ground Stop program.	Yellow

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Flight Status	Definition	Default Color
Removed	Flights that were removed by the ATCSCC CSA.	Blue
Priority	Flights that are designated as Lifeguard (LFG) or Diversion Recovery (DVT) flight. This coloring only applies to flights that are not active and overrides all other colors when selected.	Pink

Color By Arrival/Departure

The **Arrival/Departure** tab allows you to quickly view flights that are arriving at the monitored airport versus flights that are departing the monitored airport. Arriving flights are colored Light Green while departing flights are Blue.

Color By Centers

The **Centers** Tab allows you to quickly locate flights that departed from one or several centers. By default, FSM displays all centers. To color flights departing from a specific group of centers you can either select a tier level from the legend's drop-down menu or you can manually select a center or group of centers. When you select one of the options from the drop-down menu, the centers not associated with that particular group will be grayed out, leaving only the selected centers colored in red. You can also manually enter a center if it is not already a center choice. Selecting the *All* option in the drop-down menu will restore all centers back to the graph. The figure below in an example of *1st Tier* centers plus SFO selected for ATL.

Figure 6-12: Bar Graph Colored by Centers

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Color By Aircraft Type

The **Aircraft Type** Tab colors flights according to their equipment classification. Table 6-2 displays FSM default coloring for Aircraft Type.

Table 6-2: Aircraft Type Coloring

Equipment Type	Default Color
Propeller	Black
Turbo	Green
Jet	Red
Unknown	Yellow

Note: FSM simply colors flights based on their equipment types. FSM does not classify equipment types.

Color By Aircraft Class

The **Aircraft Class** Tab colors flights according to their standardized weight class, determined by the FAA. Table 6-3displays FSM default coloring for Aircraft Class.

Table 6-3: Aircraft Class Coloring

Equipment Type	Color
Small	Black
Large	Green
Heavy	Red
Unknown	Yellow

Color By Carrier

The **Carrier** Tab colors flights by airline carrier. In the **Carrier** Tab, it is useful to select ***View*** > *Show Legend* to display the color assigned to each carrier.

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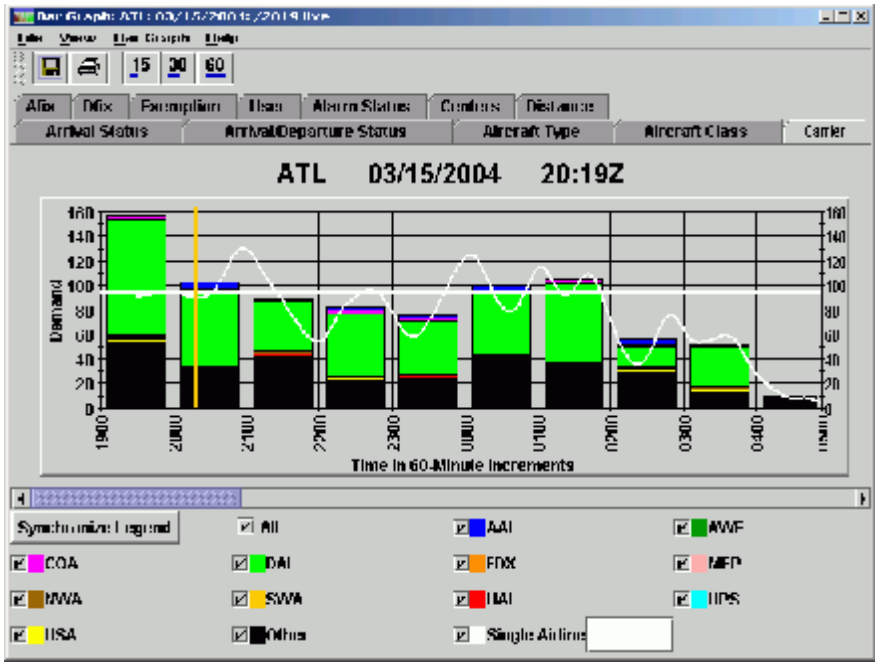

Figure 6-13: Bar Graph Color by Carrier

Uncheck the carrier checkbox in the color legend if you do not want to view a particular carrier in the component. The carrier data will remain grayed-out until the user selects the check box again to restore the carrier color back to the component.

Typing a single airline identifier into the Single Airline textbox lets you view the flights of a major carrier without viewing its sub-carrier flights. Selecting **All** will select and color all listed carriers. A maximum of 12 carriers can be displayed in the **Carrier** Tab when the Carrier option is selected. Table 6-4 displays FSM default coloring by Carrier.

Table 6-4: Carrier Coloring

Flight Carrier	Default Color
COA	Magenta
USA	Yellow
NWA	Brown
AWE	Dark Green
AAL	Blue
MEP	Dark Pink
UAL	Red
DAL	Light Green
TWA	Cyan

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SWA	Orange
Single Airline	White
Other	Black

If you are an airline user, when you select the **Carrier** Tab, the FSM default color is for flights of your carrier. Your carrier abbreviation is written in the Single Airline text box so that you immediately view your carrier's flights. For major carriers, the box next to the carrier name is selected and the carrier abbreviation is typed in the Single Airline box. This allows you to differentiate between the major and any of your sub carriers. Because of flight filtering, non-FAA operators cannot view any other carriers' flights other than those belonging to their own major or sub-carriers. All other flights will be colored black.

If you are an FAA user, FSM default is to have no carriers selected for coloring. You choose which carriers to color by putting a checkmark next to the carrier abbreviation or typing a carrier code in the Single Airline text box in the Carrier legend. When you select a major carrier to color, the major carrier and its sub-carriers will all be the color of its Major. There are more than 10 major carriers defined in the airline_info.dat program file of FSM, which defines the carriers and their colors for FSM display purposes.

Color by Arrival Fix

The **Arrival Fix** (**AFIX**) Tab colors flights according to which arrival fix the flight is approaching for the arrival airport. Arrival Fix names vary for each airport. FSM automatically generates the monitored airport's arrival fix names and assigns a color to each fix in the legend. For those flights whose arrival fix is not known, FSM assigns that fix a value of "Other."

> **Note:** All flights departing the monitored airport will be colored as "Other" because their arrival fix is at another airport.

Color by Departure Fix

The **Departure Fix (DFIX)** Tab colors flights according to which departure fix the flight has departed over at its origin airport. Departure fix names vary for each airport. FSM automatically generates the monitored airport's top departure fix names and assigns a color to each fix in the legend. For those flights whose departure fix is other than the top departure fix names listed or is unknown, FSM assigns that flight a value of "Other."

Color by Exemption Status

The **Exemption** Tab colors flights according to their status in any GDT operation. By default, flights are Non Exempt, meaning that the flight is subject to any GDT operation.

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However, in running a GDT operation, you may decide to exclude certain flights from the operation. This will change the Non Exempt status on some flights to either excluded or exempted. Exemption status for all flights is sent through the ADL. For a detailed explanation of the possible exemptions and excluded flight status, see Flight Status. Table 6-5 displays FSM default coloring for Exemption Status.

Table 6-5: Exemption Status Coloring

Exemption Status	Default Color
Flts Excluded	Black
Flts Not Exempted	Green
Flts Exempted	Red

Color By User

The **User** Tab colors flights according to their user status. User status describes the primary function of that flight. This information is sometimes masked from airline users because of flight filtering. For example, military flights will not be listed as such. Table 6-6 displays FSM default coloring for Exemption Status.

Table 6-6: User Type Coloring

User Status	Color
Air Cargo (A)	Blue
Carrier (C)	Magenta
General Aviation (G/A)	Green
Military (M)	Brown
Air Taxi (T)	Orange
Other (O)	Cyan
Unknown (U)	Red

Color By Alarm Status

The **Alarm Status** Tab colors all flights red that have at least one non-compliant alarm triggered. These flights can also be viewed by selecting individual compliance reports from the **Reports** > *Compliance* menu. Compliant flights are colored black.

Color By Distance

The **Distance** Tab colors all flights within a certain distance of the airport. The Distance tab displays all flight distances in red and allows the user to view/select distance ranges of up to 2,400 miles in 200-mile increments.

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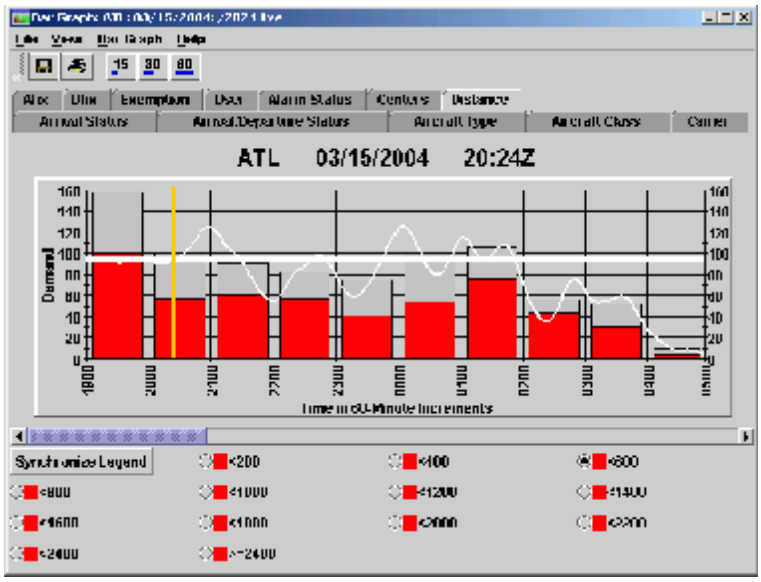

Figure 6-14: Bar Graph by Distance

Viewing Information in the Time Line Component

The FSM *Time Line* component is a timetable, which displays airport arrival and departure rates and demand in one-minute increments by hour columns. From the Time Line, you can view flights arriving at and departing from the monitored airport, as well as open arrival slots and cancellations. The selected Tab in the *Time Line* indicates the type of data displayed. The Tab coloring options are the same as described above in Flight Coloring options. Directly above the Tab options, the *Time Line* lists the airport being monitored, as well as the date and ADL time as shown in Figure 6-15.

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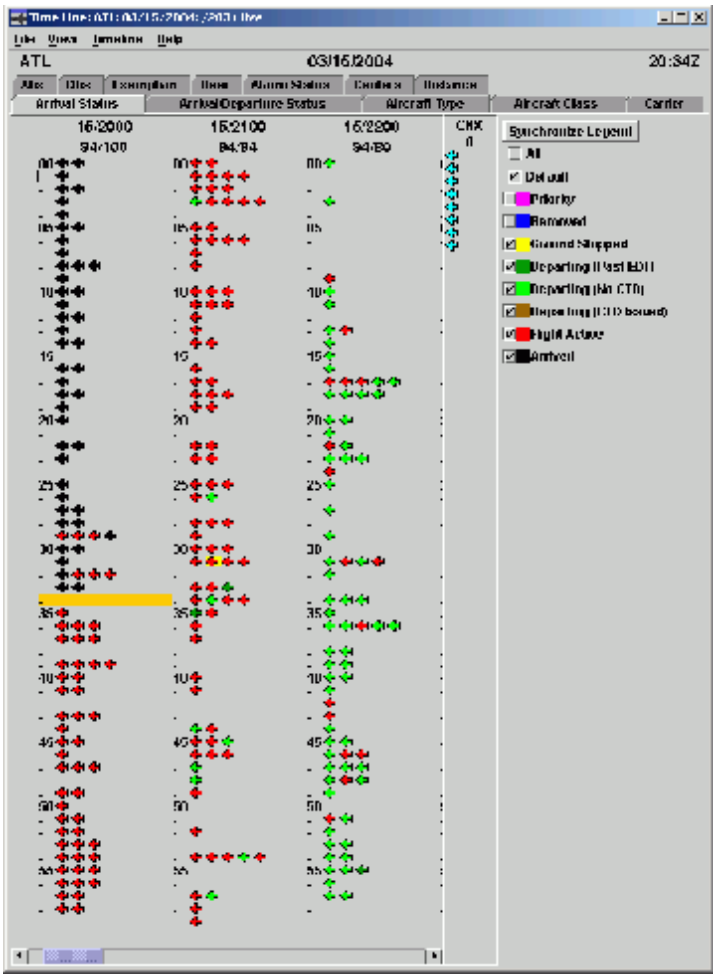

Figure 6-15: Time Line Component with Color Legend Displayed

The large numbers above each column represent the date/hour (i.e. 02/2100 indicates that you are looking at the 2100 hour for the 2nd day of the month). Directly below the date/hour information is the AAR and/or ADR versus the demand on the airport (the number of flights projected to arrive) for the hour at which you are looking. For example, Figure 6-15 shows 94/83 at the 2100z hour, which indicates that the Airport Arrival Rate (AAR) is 94 flights and 83 flights, are expected to arrive in that hour. The Airport Departure Rate versus demand is displayed in parentheses when **View** > *Departure Data* is selected. For example, if the *Time Line* displayed (90/85), this would indicate that 90 is the Airport Departure Rate and 85 flights are projected to depart for that hour. The orange bar indicates the last data update time.

Each flight arriving at the monitored airport is shown beside the hash mark, which corresponds to the ETA of the flight. Cancelled flights are displayed under the CNX column. You can show or hide icons for canceled flights by selecting **View** > *Show Cancellations* from the *Time Line* menu bar. FSM keeps and displays flight data compiled by Volpe National Transportation Systems Center, which includes data for up to 20 hours after the current time.

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Icons in the Time Line

- *Airplane Icons* represent flights arriving at or departing from the monitored airport. Arriving flights are facing left while departing flights are facing right. Clicking an arrival flight icon will highlight the flight by putting a white square around the icon. If the flight has been delayed, the open arrival slot that resulted from its delay will also be highlighted.
- A *filled square icon* will only appear when a GDP is in effect. The filled square represents an arrival slot left open by a canceled flight. The arrival slot is open and available for use by other flights. Canceled flights are displayed on the Time Line under the CNX heading and will be highlighted when their associated slot is clicked.
- A *wire-framed square icon* also corresponds to a canceled flight. However, this arrival slot is not available for use by other flights. Clicking this icon will highlight its associated canceled flight, displayed under the CNX column of the Time Line.
- A *filled triangle icon* will only appear when a GDP is in effect. The filled triangle indicates an open arrival slot due to a delayed flight. The arrival slot has been left open and is available for use by other flights. Clicking this icon will also highlight the delayed flight that caused the slot to open up.
- A *wire-framed triangle icon* also corresponds to a delayed flight. However, this arrival slot is not available for use by other flights. Clicking this icon will also highlight the associated delayed flight.

You can find an explanation for any of the *Time Line* Icons by using **Help > Legend** in the FSM main *Control Panel* component.

Table 6-7: Time Line Legend

Time Line Icon	Description
	Indicated the latest or current ADL file data update time in the Time Line component.
	A flight arriving at the monitored airport by ETA in the Time Line component and colored by the current color scheme.
	A flight departed from the monitored airport by ETD in the Time Line component and colored by the current color scheme.
	An open slot due to a cancelled flight, which is included in a GDP. It is positioned at its arrival slot time and is colored by carrier.
	An open slot due to a cancelled flight, which is not included in a GDP. It is positioned at its (IGTA-taxi) and colored by carrier.

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Time Line Icon	Description
	An open slot due to a delayed flight that is included in the GDP. It is positioned at its arrival slot time and colored by carrier. The corresponding flight is positioned at a later time matching the ETA.
	An open slot due to a delayed flight that is not included in the GDP. It is positioned at its (IGTA – taxi) and colored by carrier. The corresponding flight is positioned at a later time matching the ETA

View Open Arrival Slots

To view open arrival slots that resulted from delayed or canceled flights, check the **View** > *Slots in Carrier Color* checkbox from the *Time Line* menu. Slots will appear on the *Time Line* as square (canceled) or triangle (delayed) icons. Note that airline users will only see their own slots in the color that FSM designates for their airline. Any slot left open from another carrier's canceled or delayed flight will be colored black.

Moving Through the Time Line

You can scroll forward and backward through the *Time Line* component in a variety of ways:

1. Drag the small square along the scroll bar at the bottom of the *Time Line.*
2. Click the arrow at either end of the scroll bar at the bottom of the *Time Line.*
3. Click anywhere in the scroll bar at the bottom of the *Time Line.*
4. Use the left/right/up/down arrows on your keyboard to move back and forth up or down.
5. Use the Enter key on your keyboard to move down and to the next minute row.
6. Use the Tab key on your keyboard to move to the next column.
7. Use the Page Up key on your keyboard to move to the top of a column.
8. Use the Page Down key on your keyboard to move to the bottom of a column.
9. Use the Home key on your keyboard to move to the first column.
10. Use the End key on your keyboard to move to the last column.

To update the *Time Line* when the current hour changes select **Time Line** > *Track Time* in the *Time Line* Menu Bar. When Track Time is selected, the Time Line will advance when the hour changes. By default, the Track Time option is selected.

Time Line Flight Count

To obtain a flight count for a particular group of flights on the *Time Line*, select the icon's hour number and press and hold the 'Ctrl' key on your keyboard as you select the last icon's hour number. This will count all flights in the selected area that are colored

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according to a "Color By" criteria. FSM will also give you an AAR and/or ADR for that time period. You must select at least two minutes worth of flight data.

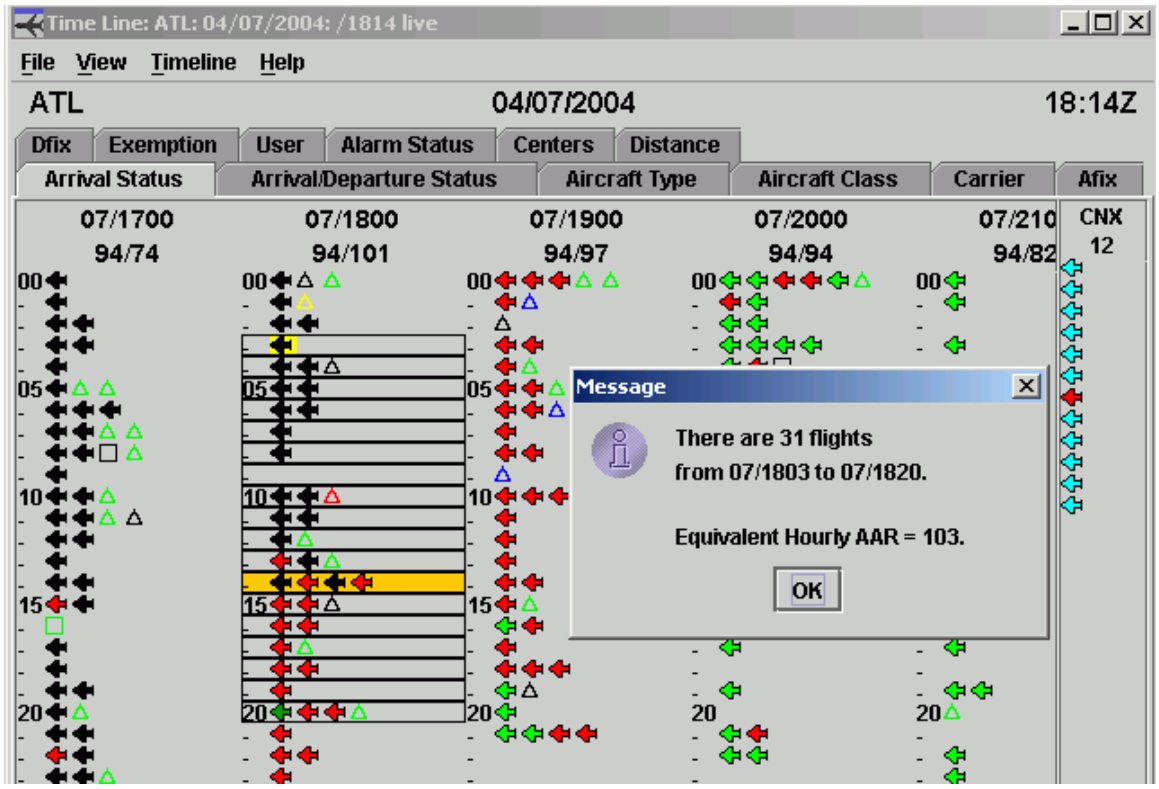

Figure 6-16: Flight Count List

When you select a group of flights to count on the *Time Line*, FSM returns information about the count. This includes the total number of flights, how many flights are arrivals and departures, the time period and the equivalent AAR and/or ADR. The AAR and ADR values are derived using: AAR = (#flts/#minutes) x 60.

Time Line Flight List

To obtain a flight list for a particular group of flights on the *Time Line*, click on a flight icon and press the 'CTRL' key on your keyboard as you select the last icon. This will create a flight list in the selected area that is colored according to a "Color By" criteria. You must select at least two minutes worth of flight data. See Figure 6-17.

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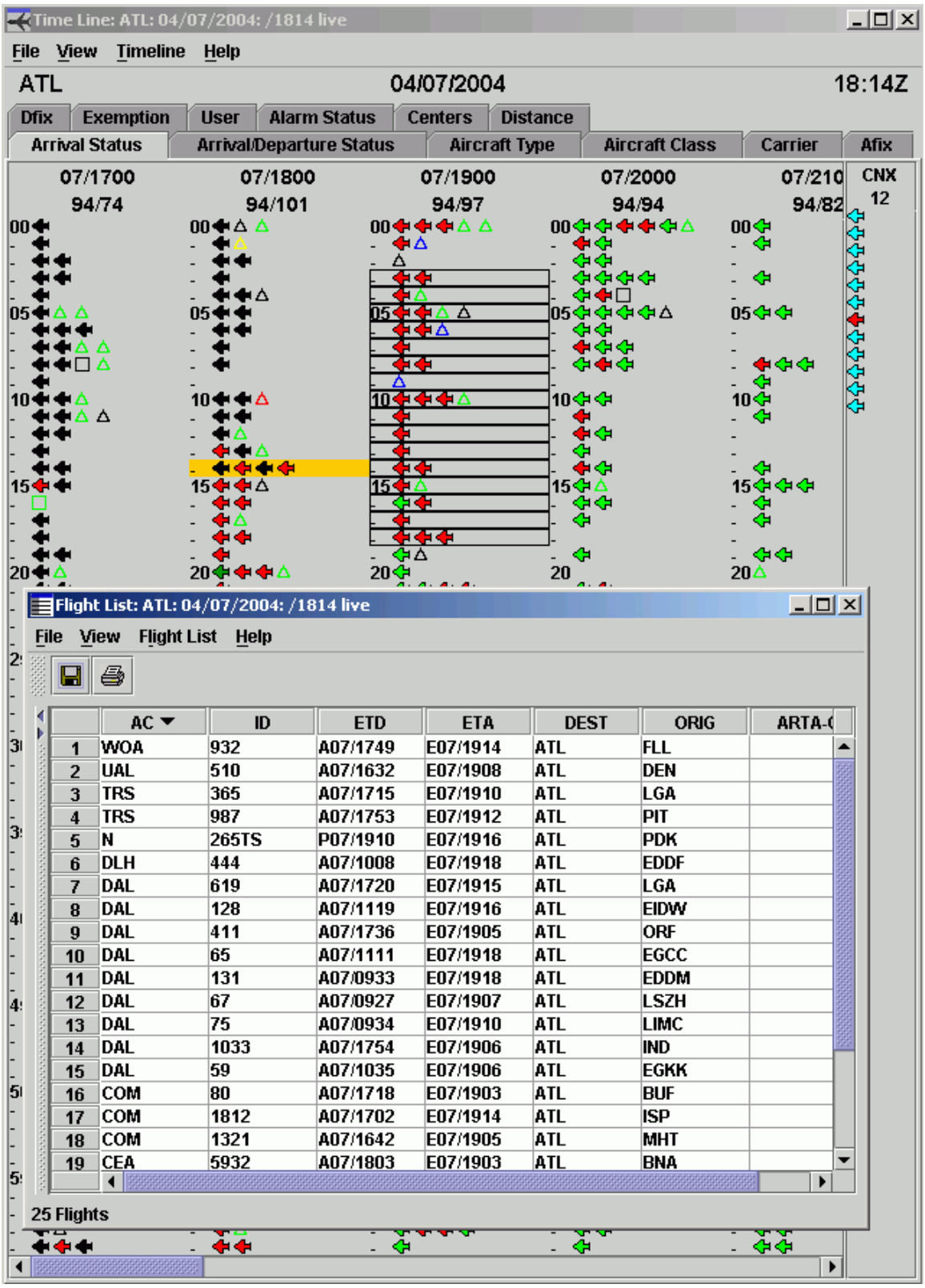

Figure 6-17: Flight List

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GDT Time Line Display Options

The GDT *Time Line* gives you the option to display flights according to different flight data. When you choose different criteria to use in the FSM Flight display, your changes will affect both the FSM *Time Line* and *Bar Graph* components.

Flight Display Options

To change the display in the *GDT Time Line* select **Display** in the GDT *Time Line* menu bar and select one of the radio button options in the drop-down window.

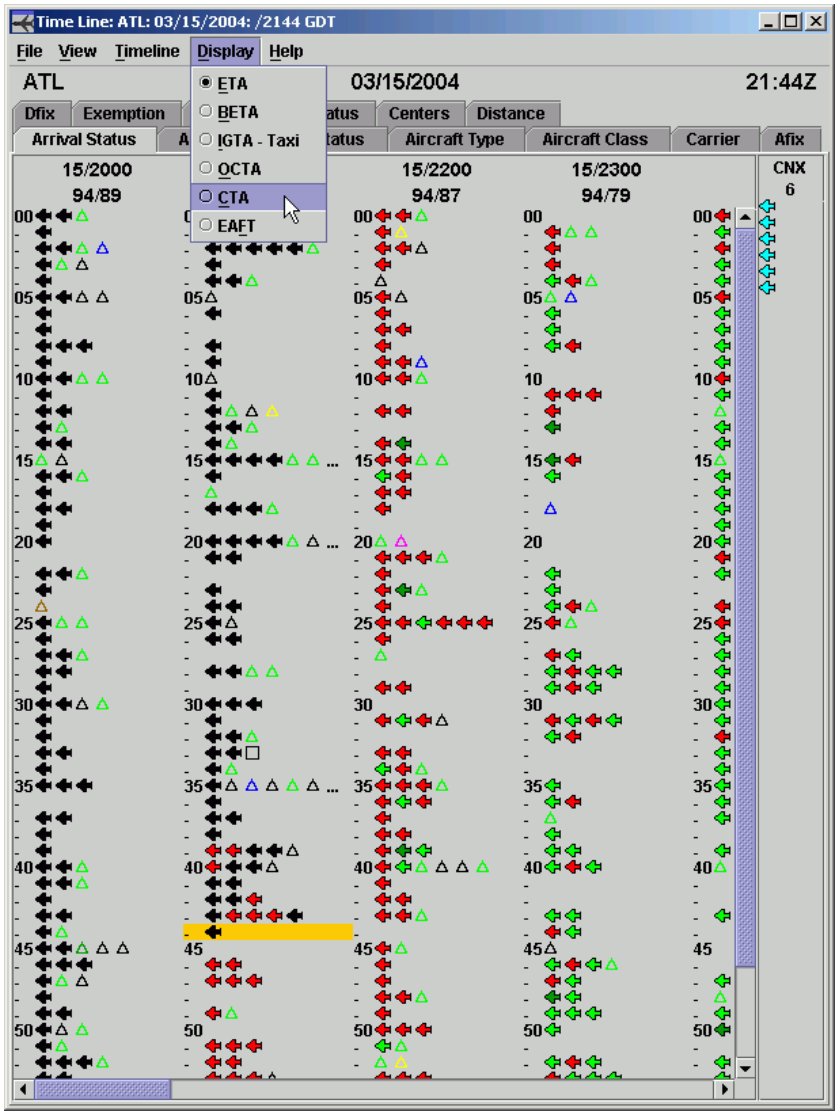

Figure 6-18: GDT Time Line Display by CTA

The following describes the options available in the **Display** menu:

1. **Display** > *ETA* displays flights in the Timeline according to their ETA.

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2. **Display** > BETA displays flights according to their original ETA, IGTA Wheel Time or ETA. If the original ETA time is missing, flights are displayed according to IGTA Wheel Time. If IGTA Wheel Time is missing, ETA is used to display flights.
3. **Display** > *IGTA - Taxi* displays flights according to their IGTA Wheel Time (IGTA - Taxi Time). Taxi time default is 10 minutes, but can be changed in the GDT Control Window by the user.
4. **Display** > *OCTA* displays flights according to their Original CTA, Original ETA, OGTA Wheel Time or ETA position, depending on the available information. For instance, if the Original CTA is not available, FSM uses Original ETA and so on.
5. **Display** > *CTA* displays flights according to the most recently updated Controlled Time of Arrival.
6. **Display** > *EAFT* displays flights according to their Estimated Arrival Fix Time, which is the time at which the flight crosses its designated arrival fix.

Flight Lists

About Flight Lists

Flight Lists are generated automatically when FSM performs certain functions and can be generated for a specific group of flights you choose. Flight Lists allow you to view what flights are contributing to the arrival demand at an airport and how many flights fall into specific categories. An FSM Flight List can be opened in a variety of ways from all FSM modes and several FSM components. Flight Lists can be obtained from the *Bar Graph*, *Time Line, Status Map, Open Data Set, Query Manager,* and *GDT Setup* components.

Depending upon the type of information you need, the way a Flight List is generated will differ. **Report** Flight Lists will vary in the initial default information displayed, but the functionality described below is the same. For more information on Report Lists, see *Chapter 3 Control Panel*. When you only want to see flights that meet certain criteria, a Flight List can be generated from the *Query Manager* component. From a Flight List you can also select a single flight and chose to view the Flight Info or Flight Details for that flight, by right clicking on the selected flight or by using the **File** menu options. All Flight Lists are dynamic and are updated along with every ADL update.

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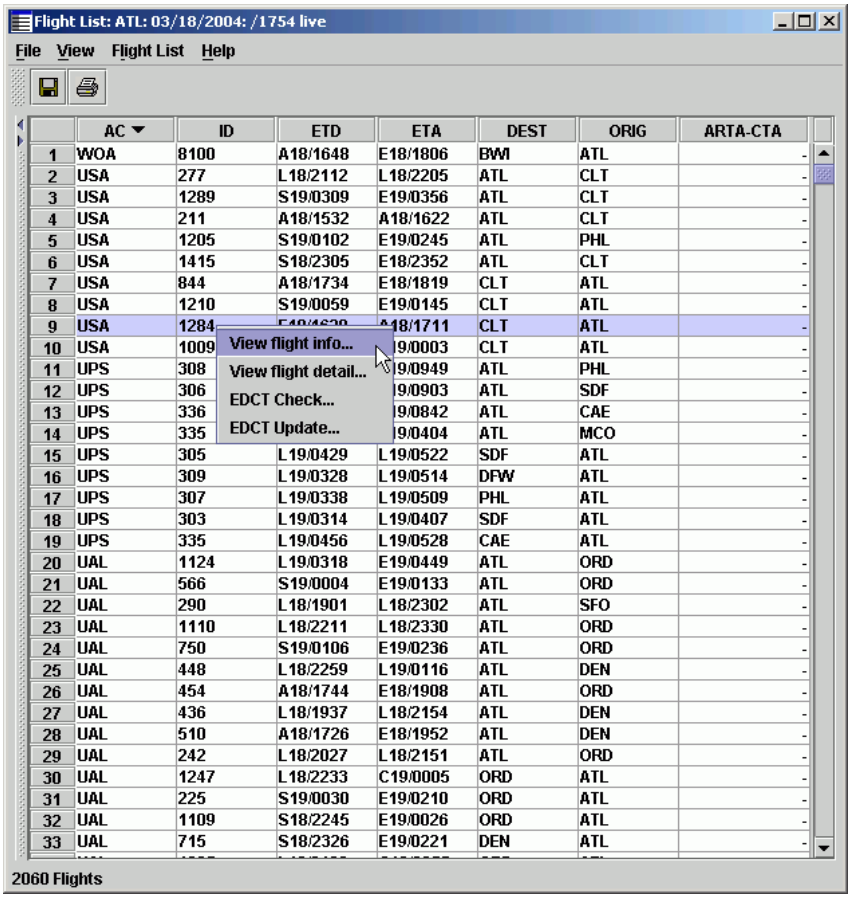

Figure 6-19: Flight List

Choosing Flight List Information

There are certain default values for Flight List information categories. When a Flight List is initially opened, the default information will be displayed (the default information is configurable). FSM default settings, (which if not changed in the configuration file) will appear in the Flight List when opened, are listed below:

- **ACID** – The air carrier (AC) and aircraft identification number (ID). This is a three letter carrier code followed by the flight's identification number. For example, UAL1234 indicates a United Airlines flight with ID number 1234. Airline users will only see their own carrier and sub-carriers ACIDs; all other flights are masked.
- **ETD** – The flight's Estimated Time of Departure
- **ETA** – The flight's Estimated Time of Arrival
- **DestAp** – The airport from which the flight is departing
- **OrigAp** – The airport at which the flight is arriving.
- **ARTA** – Actual Runway Time of Arrival
- **ARTD** – Actual Runway time of Departure
- **ARTA – ARTD** – Actual Runway time of Arrival – Actual Runway time of Departure. This gives an accurate calculation of the flights ETE.

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To add or remove data column information from an existing Flight List, click **View** > *Select Data Columns* from the Flight List menu. The *Column Settings* window appears displaying all possible informational categories that can be viewed in FSM's Flight Lists. The categories correspond to the available data fields in the ADL. The Data elements that are currently viewed in the Flight List will be listed in the **Shown** scroll box, as seen in Figure 6-20 below.

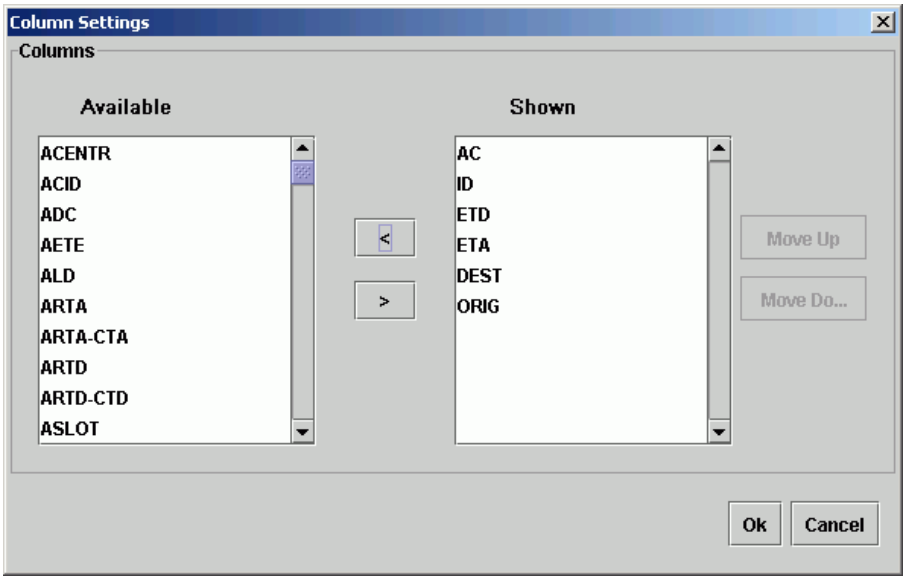

Figure 6-20: Column Settings Window

To select an additional data element to display in the Flight List, select a data field in the **Available** scroll box and click the right arrow button or double click to move the category to the **Shown** scroll box. To remove a **Shown** data field, the user can double-click or select the field and press the left arrow button to move the data field back to the **Available** scroll box.

Opening Flight Lists

1. **Show Data Set Flight Lists –** From the *Open Data Set* Component, select the desired data set by clicking the airport information in the scrolling area of the window and then check the *Flight List* component selection in the **Open With** section of the screen. Press **Apply** or **OK** to generate a *Flight List* for the selected airport.
2. **Bar Graph Flight Lists –** To view flights that specifically make up the arrival demand for a certain hour in the FSM *Bar Graph*, double-click any bar to generate a Flight List (For more information on Bar Graphs, see Chapter 3). If the **View** > *Show Cancellations* check box is selected in the Graph window, cancelled flights will also be listed.

Note: Even if the Bar Graph is displayed in 15 or 30-minute time increments, the Flight List generated will display all flights contained in the entire hour.

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3. **Time Line Flight Lists** –To get a Flight List for a particular group of flights, first click on the minute hash-mark to start your flight list and a box will appear around the flights in the minute you just selected. Then press CTRL + the minute you want to be at the end of your Flight List. These actions will automatically give you a flight list for the group of flights you have just selected.
4. **US Map Flight Lists** – You can access a Flight List for a monitored airport directly from the *US Map*. Select the airport by clicking on the airport with your mouse and the airport will turn white in color when selected. In addition to turning white, the airport's last ADL time will also be displayed, day then time. After an airport is selected, right-click on the airport to display a pop-up menu, which includes the zoom options as well as the options to view *the Time Line, Bar Graph,* or *Flight List* components for that airport in monitor mode. Select *Show flights in flight list…* to view the Flight List for that airport.

Flight List Format

Although there are many ways to generate an FSM Flight List, the lists are always in the same format. Each Flight List gives you information regarding its generated status. This includes:

- Flight Lists are generated in spreadsheet format and the lists can be managed with similar functionality.
- The Flight List can be resized and/or scrolled through with the use of the window scroll bars and arrows.
- The Component information including: Three-letter airport code: Date: ADL Time, and which mode the data was retrieved in, is displayed in the Flight List title bar.
- The number of flights contained in the list is displayed in the bottom left corner of the flight list component.

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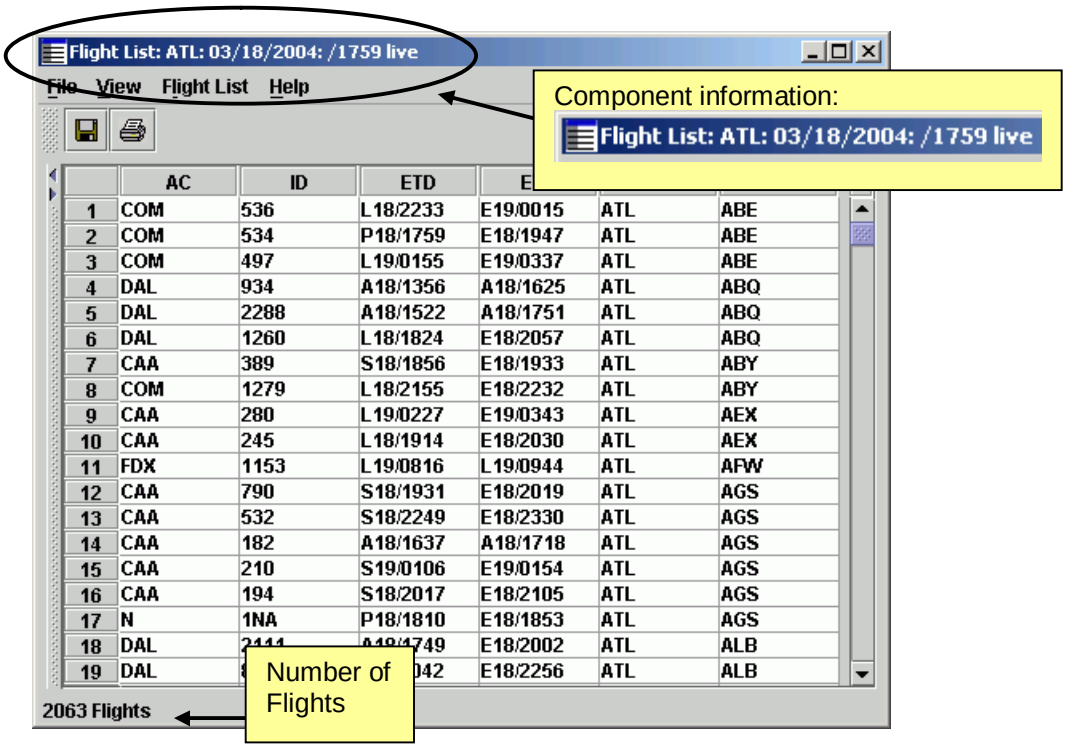

Figure 6-21: Flight List

Grouping Information in the Flight List

Once a Flight List has been created, the information can be grouped according to your own needs. To group a flight list select **View** > *Group Flights* on the Flight List menu bar. The **Group** window enables either individual or multi-level grouping of all data fields that are currently displayed in the Flight List.

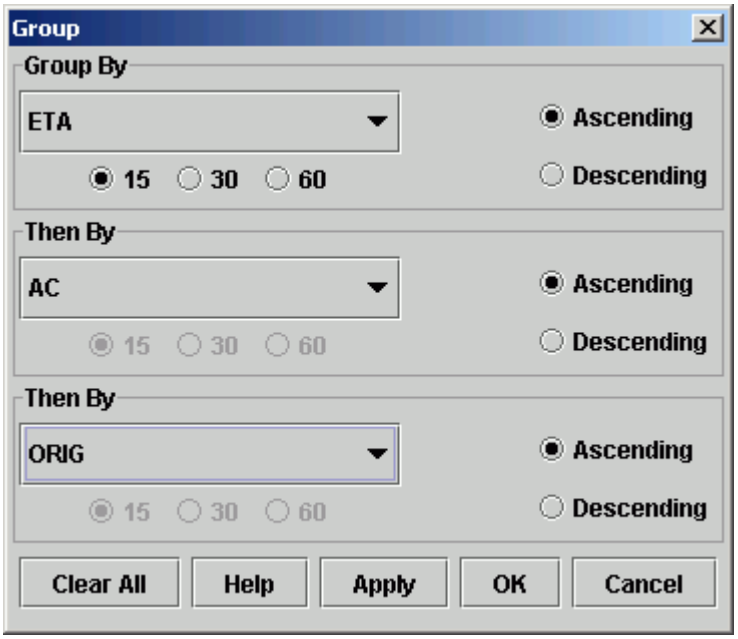

Figure 6-22: Flight List Grouping Window

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To select a category to group, select a data field in the *Group By* drop-down window and click either the Ascending or Descending radio button. Select **OK** or **Apply** in the *Group* window and the Flight List will group flights according to the parameters you set.

Multi-level Grouping

You can also group according to multiple categories in the Flight List. To use multi-level grouping, select a data field in the *Group By* drop-down window and click either the Ascending or the Descending radio button option. Select a data field in the *Then By* drop-down window and click either the Ascending or the Descending radio button option in the reverse order in which you want to group. For example, if you wanted to group your filtered Flight List by the Initial Gate Time of Arrival (IGTA), Airline and Origin Airport (OrigAp) respectively, you would make the following drop-down selections in the Group component:

1. Select **ETA** data field title and select its corresponding Ascending radio button.
2. Select **AC** data field title and select its corresponding Ascending radio button.
3. Select **ORIG** data field title and select its corresponding Ascending radio button.

In addition, you can specify time increments of 15, 30 and 60 minutes for data fields that are time based by selecting the corresponding radio buttons in the Group component. After all the grouping parameters are selected, pressing **Apply** or **OK** will generate a new Flight List with the flights grouped accordingly. You can expand a group by double clicking on the group or clicking on the expand/collapse icon. Drilling down will display individual flights within each group set. Above the grouped flights windows, the grouping parameters are specified.

Group Window Buttons

1. **Clear All** – Pressing the **Clear All** button will erase all selections in the Group Window. Pressing **Apply** or **OK** after **Clear All** has been utilized will return it to the default Flight List.
2. **Help -**The **Help** button displays information about the component version currently running in the *Group* window.
3. **Apply** -The **Apply** button keeps the *Group* window open after the flight list has been updated.
4. **OK** - The **OK** button closes the *Group* window after the flight list has been updated.
5. **Cancel** - The **Cancel** button cancels any selections made and closes the *Group* window (restores the default selections)

Figure 6-23 below, is a figure of the flights grouped by ETA, then Carrier, then Origin Airport. The Flight list is displayed in a split screen and grouped flights are put into folders that can be expanded for more detail. This grouped flight list corresponds with the Group window parameters shown previously in Figure 6-22.

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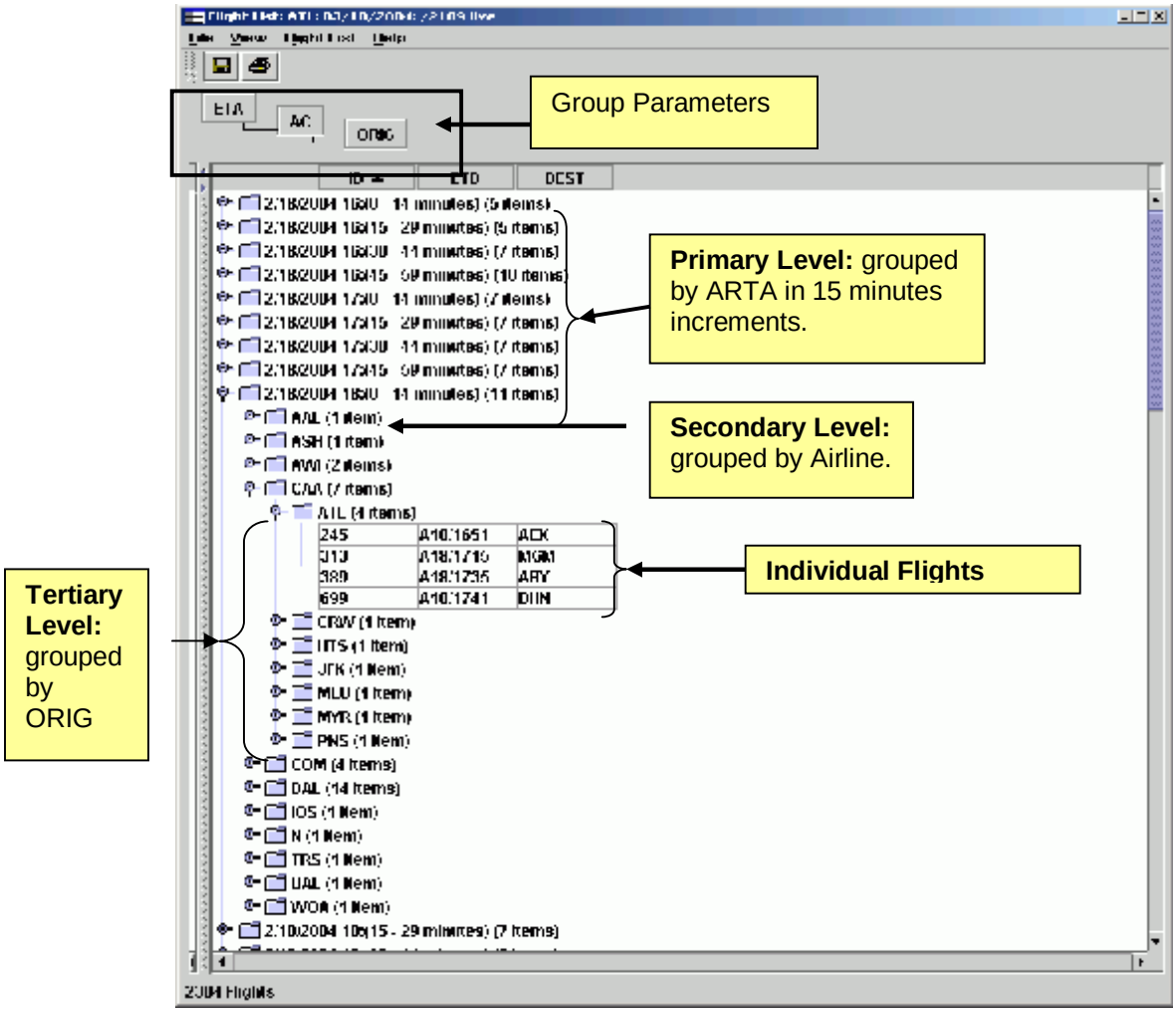

Figure 6-23: Flight List Grouped

*To return to the normal Flight List Display, select **View** >* Group Flights to access the Group Window, then select **Clear All** and press **OK**.

Flight List Column Positioning

You can arrange the order your columns are displayed with two different methods. The easiest and most convenient method is to do it directly from the Flight list itself, by dragging and dropping the column header to the desired position in the List. The second method uses the Column Settings window. Select **View** > *Column Settings* from the *Flight List* menu to access the Column Setting window and move the column positions by selecting the ADL data field (column header) from the Shown scroll box and move it up or down the list using the **Move Up** or **Move Down** buttons located to the right of the **Shown** scroll box. Moving a data element to the top of the *Column Settings* window will position the data element header to the left most column on the Flight List. Once the data fields are selected in the *Columns Setting* window, click **OK.** =

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Sorting Information in the Flight List

Once a Flight List has been created the information can then be sorted and arranged according to your own needs. You can sort the list by one column category at a time by double clicking the column heading. The arrow at the top of the column indicates that ascending or descending order for that category sorts the Flight List column. To sort by multiple categories select **View** > *Sort Flights* from the Flight List menu bar. The **Sort** window displays the data fields that are currently listed in the Flight List. The data fields correspond to the available data fields in the ADL.

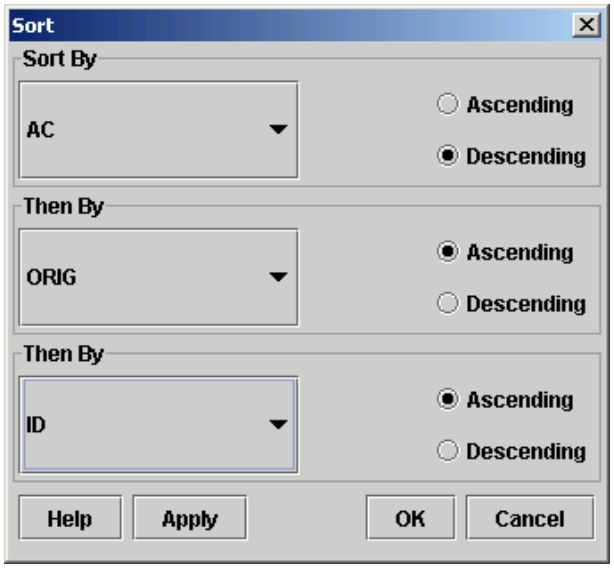

Figure 6-24: Sort Window

Multi-level Sorting

From the **Sort** window, shown in Figure 6-24, select a data field in the *Sort By* drop-down window and click either the Ascending or the Descending radio button. Select data fields in the next two *Then By* drop-down menus and click either the Ascending or the Descending radio button for each data element in the reverse order in which you want to sort. For example, if you wanted to sort your Flight List by air carrier (AC), airport origin (Orig) and ID respectively, you would make the following drop-down selections in the Sort Component:

1. Select **AC** data field title and select its corresponding Descending radio button.
2. Select **Orig** data field title and select its corresponding Ascending radio button.
3. Select **ID** data field title and select its corresponding Ascending radio button.

Select **OK** or **Apply** in the *Sort* window and the Flight List will sort flights according to your sort parameters.

Sort Window Buttons

1. **Help** - The **Help** button displays information about the component version currently running in the Sort window.
2. **Apply** - The **Apply** button keeps the Sort window open after the flight list has been updated.

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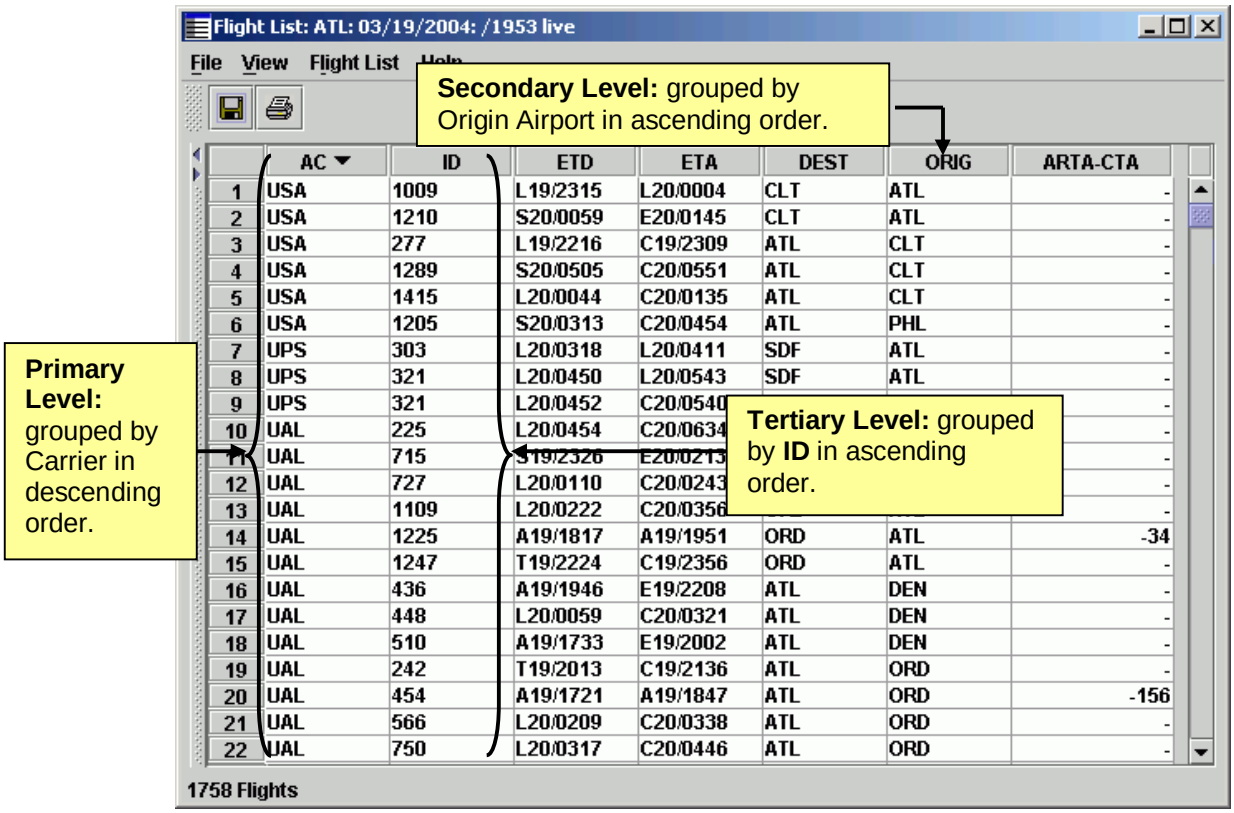
3. **OK** - The **OK** button closes the Sort window after the flight list has been updated.
4. **Cancel** - The **Cancel** button cancels any selections made and closes the Sort window.

Figure 6-25 displays flights sorted by Carrier, then Orig, and then ID. This sorted Flight List corresponds with the Sort window parameters shown previously in Figure 6-24.



	AC	ID	ETD	ETA	DEST	ORIG	ARTA-CTA
1	USA	1009	L19/2315	L20/0004	CLT	ATL	-
2	USA	1210	S20/0059	E20/0145	CLT	ATL	-
3	USA	277	L19/2216	C19/2309	ATL	CLT	-
4	USA	1289	S20/0505	C20/0551	ATL	CLT	-
5	USA	1415	L20/0044	C20/0135	ATL	CLT	-
6	USA	1205	S20/0313	C20/0454	ATL	PHL	-
7	UPS	303	L20/0318	L20/0411	SDF	ATL	-
8	UPS	321	L20/0450	L20/0543	SDF	ATL	-
9	UPS	321	L20/0452	C20/0540			-
10	UAL	225	L20/0454	C20/0634			-
11	UAL	715	S19/2326	E20/0213			-
12	UAL	727	L20/0110	C20/0243			-
13	UAL	1109	L20/0222	C20/0356			-
14	UAL	1225	A19/1817	A19/1951	ORD	ATL	-34
15	UAL	1247	T19/2224	C19/2356	ORD	ATL	-
16	UAL	436	A19/1946	E19/2208	ATL	DEN	-
17	UAL	448	L20/0059	C20/0321	ATL	DEN	-
18	UAL	510	A19/1733	E19/2002	ATL	DEN	-
19	UAL	242	T19/2013	C19/2136	ATL	ORD	-
20	UAL	454	A19/1721	A19/1847	ATL	ORD	-156
21	UAL	566	L20/0209	C20/0338	ATL	ORD	-
22	UAL	750	L20/0317	C20/0446	ATL	ORD	-

Figure 6-25: Sorted Flight List

Flight Filtering in Flight Lists

The Apply Filter window, in the flight list, displays a pre-determined list that allows you to arrange the data in the Flight list according to your selection. Select the Apply Filter option, **View** > *Apply Filter* or Ctrl + A, then select one option in the Apply Filter window to arrange the data field in the Flight List.

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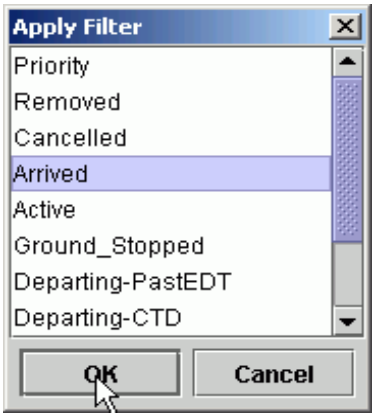

Figure 6-26: Apply Filter Window

When the "Arrived" option is selected, the data in the Flight List is arranged according to the arrived flights in the Flight List. To cancel the previously applied filter select **View** > *Clear Filter* or Ctrl + L. This will set the Flight List back to its original settings.

Flight List Menu

The menu bar in the Flight List component contains four menu options: **File, View, Flight List,** and **Help.**

1. **File Menu**

File > *Save as* - Saves the *Flight List* to a text file, which can be opened later and used again.

File > *Print* – Prints the Flight List information viewed on the monitor screen.

File > *Close* - Closes the *Flight List* component.

2. **View Menu**

View > *Rename window*– Displays the Rename Window dialog box and allows you to change the title bar name.

View > *Select Data Columns* - Allows you to add or delete ADL data fields to the Flight List.

View > *Group Flights* - Allows you to group ADL data fields to the Flight List in ascending or descending order.

View > *Sort Flights* - Allows you to sort ADL data fields to the Flight List in ascending or descending order.

View > *Apply Filter* or Ctrl + A – Allows the user to apply a filter to the data fields in the Flight List

View > *Clear Filter* or Ctrl + L – Allows the user to clear a filter from the data fields in the Flight

View > *Flight Info* - Opens the *Flight Info* window.

View > *Flight Detail* - Opens the *Flight Detail* window.

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3. **Flight List Menu**

Flight List > *Set Time* – Sets the time for the Flight List component in Historical mode only.

Flight List > *Search by Call sign* or Ctrl + F – Opens the *Search by Call sign* window.

4. **Help Menu**

Help > *Flight List* - Accesses the web-based on-line help for Flight Lists.

Viewing Information in the Bar Graph Component

The *Bar Graph* component allows you to view overall demand of the airport being monitored. Airport demand is made up of the total flights using the airport for arrival and departure. The *Bar Graph* displays airport demand information as it is received through ADLs.

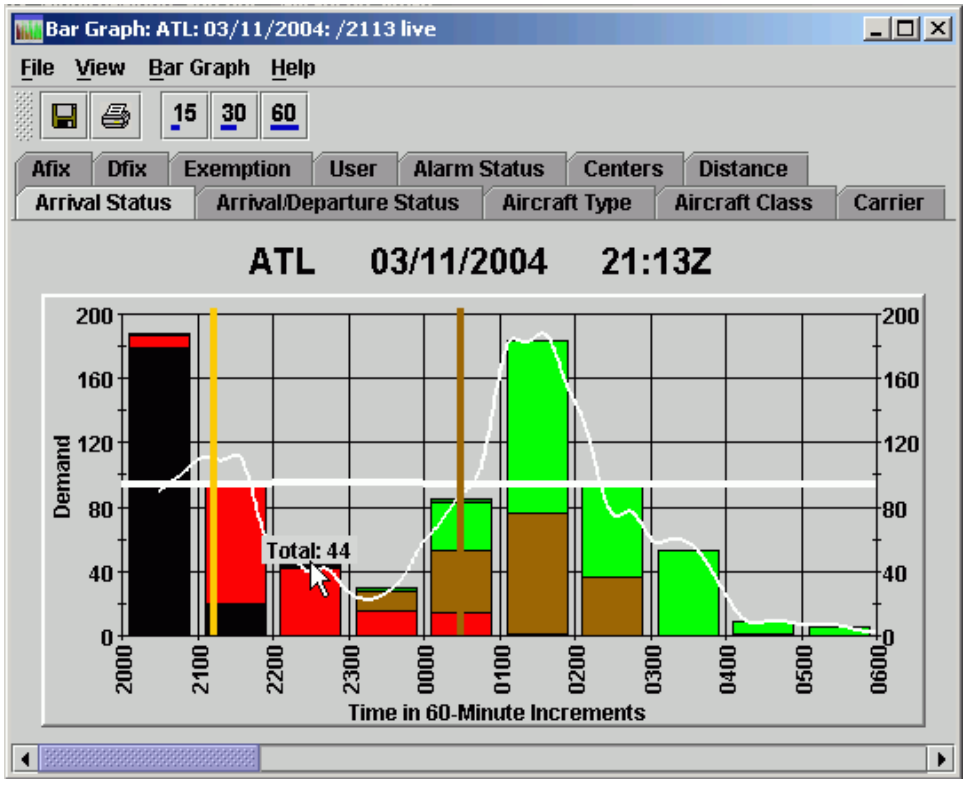

Figure 6-27: Bar Graph Component (live) Mode

The airport, date, time, and data mode are displayed in the *Bar Graph* title bar. The airport, date, and last ADL update time is also displayed just above the *Bar Graph* coloring Tabs. See Chapter 3: Bar Graph for more detailed information on the *Bar Graph* component.

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View a Single Flight

Search by Call Sign

From the *Time Line* component select **Time Line** > *Search Flight by Call Sign* or press Ctrl + F on your keyboard to access the Search Flight by Call Sign dialog box, which allows you to find a particular flight by entering the flight's call sign and original airport. The original airport field is optional. In FSM, the uniqueness of a flight relies in the call sign, origin and destination. In performing the search, if you enter only the call sign, leaving Origin blank, FSM will find the first flight with that call sign regardless of the original airport. There may be other flights with the same call sign, but different original airports that you are not able to see.

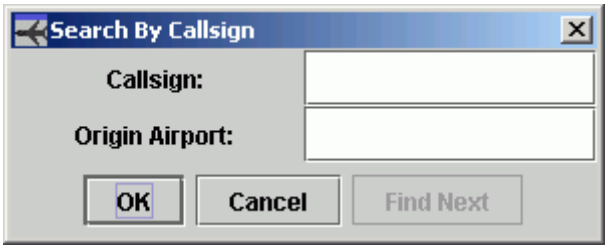

Figure 6-28: Search By Call sign Dialog Box

After entering the search criteria, you have three options on the *Search Flight by Call Sign* dialog box:

1. **OK** - Performs the search and closes the Search Flight by Call Sign window.
2. **Cancel -** Closes the window without performing the search.
3. **Find Next -** Locates the next flight that has the same call sign and/or original airport and leaves the Search Flight by Call Sign dialog box open for you to perform another search. If the flight is unique, FSM tells you that another flight has not been found.

Flight Info Window

Individual flight information is displayed in the **Flight Information** window by right clicking on any flight icon in the *Time Line* component or by right clicking on a single flight in a Flight List. The Flight Info window gives you some general ADL information for the selected flight. There are two ways to access the **Flight Information** window:

1. Right-click any flight icon in the FSM *Time Line*.
2. Right-click a flight in any FSM Flight List. (See Flight Lists.).

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Figure 6-29: Flight Information Window

Flight Information Data

The Flight Information window contains the following information:

- **Date/Time:** The date and time at which you are viewing the flight. In Live Mode, this is always the current date and time.
- **Flight ID:** The aircraft call sign (a combination of airline code and flight number). This information is filtered for airline users.
- **Status**: Flight Status will be one of several; delay, cancellation, or ground delay options.
- **Orig:** Origin airport of the flight, with the corresponding center in parentheses.
- **Dest:** Destination airport of the flight, with the corresponding center in parentheses.
- **ETD:** Most recent Estimated Departure Time for the flight.
- **ETE:** When available, actual time en route is given for the flight. Otherwise, an estimated time en route is given.
- **ETA:** Most recent Estimated Arrival Time for the flight.
- **CTD:** The Control Time of Departure for the flight, if it has one.
- **CTA:** The Control Time of Arrival for the flight, if it has one.
- **Delay:** If the flight is delayed, one of the delay codes will be highlighted. ALD indicates that the carrier imposed delay on the flight. GDP indicates that the flight is delayed because of a ground delay program. FAD indicates that the flight is delayed because of a fuel advisory. GSD indicates that the flight is delayed because of a ground stop. TOD indicates the flight is delayed because its EDT has timed out in ETMS; the flight passed its ETD without taking off.
- **Cancel:** If the flight is canceled, one of the cancellation codes will be highlighted. UX indicates that the flight was canceled due to an EDCT update, which may be used by a traffic manager to cancel a flight. FX indicates that the flight was canceled using an FX message, which is the CDM message used by the airlines to indicate a canceled flight. RZ indicates that the flight was canceled using an RZ message, which is a NAS flight plan cancellation message. RS

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indicates that the flight was canceled using an RS message, which is an internal ETMS message generated when a specialist takes an OAG flight out of the database. TO indicates that ETMS considers the flight time out canceled because no activation message has been received within a certain time of the predicted departure time. The amount of time out delay is indicated in parentheses. DV indicates that the flight was canceled and diverted to an alternate destination. RM indicates that the flight has been removed from the ETMS database.

- **View Flight Details Button**: Selecting this button brings up the Flight Detail window. This window provides more detailed information of the flight.

Flight Info Menu

The menu bar in the Flight Info window contains three options: **File, View,** and **Help**.

1. **File Menu**

File > *Save as* - Saves the Flight Information to a text file, which can be opened later and used again.

File > *Print* – Prints the Flight Information viewed on the monitor screen.

File > *Close* - Closes the Flight Information window.

2. **View Menu**

View > *Flight Detail*– Displays the Flight Detail window.

3. **Help Menu**

Help > *Flight Information* - Accesses the web-based on-line help information for the Flight Information window.

Flight Detail Window

Use **Flight Detail** to obtain more detailed information for a specific flight than is given in the Flight Information window. To do this, right-click any flight icon in the *Time Line* component or right-click an individual flight from a Flight List window and select *View Flight Detail*. This will access the Flight Detail window (see Figure 6-30). There are four ways to access the **Flight Detail** window:

1. Right-click any flight icon in the FSM *Time Line* and select *Show Flight Detail.*
2. Right-click a flight in any FSM Flight List and select *Show Flight Detail.*
3. Select **View Flight Detail** button from the Flight Information window.
4. Select **View** > *Flight Detail* in the Flight Information window.

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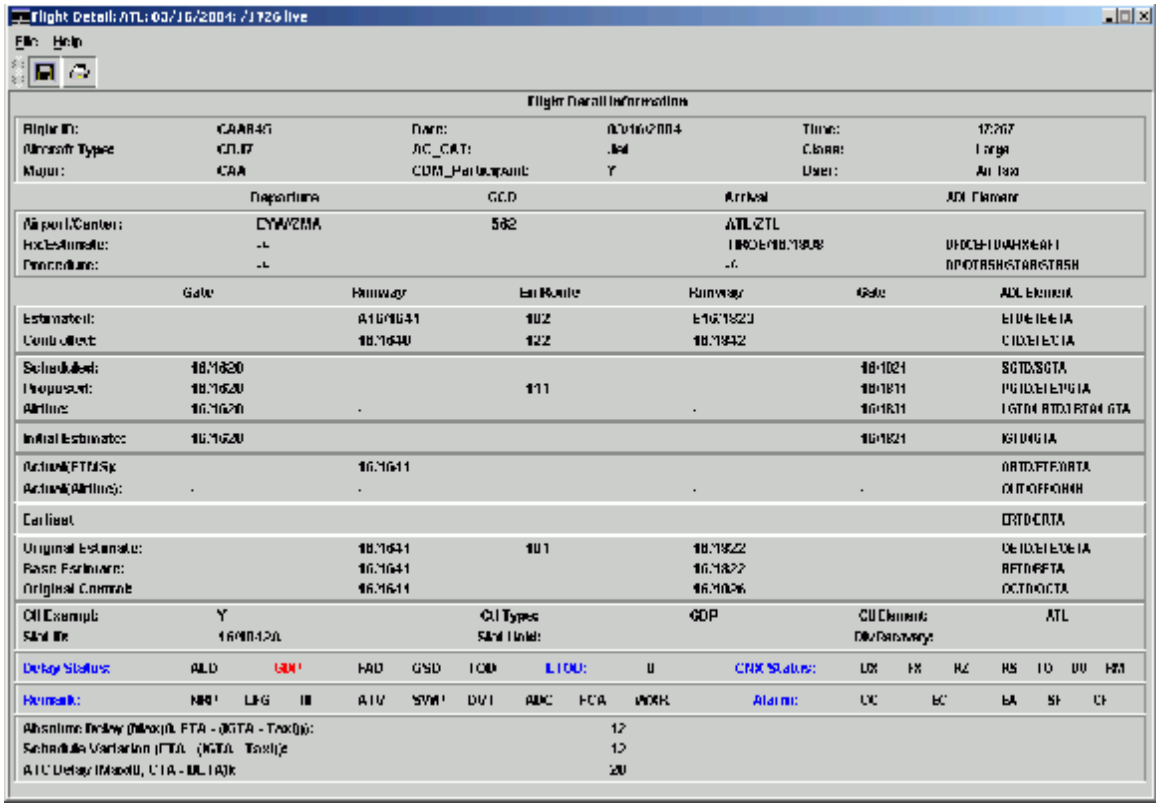

Figure 6-30: Flight Details Window

Flight Detail ADL Data Elements

The Flight Details window contains the following information:

- **Flight ID:** This is the code that identifies the airline and flight number.
- **Date/Time:** The date and time at which you are viewing the flight. In Live Mode, this is always the current date and time.
- **Aircraft Type:** Indicates the type of aircraft being used for the flight.
- **AC_CAT:** Indicates the equipment type: propeller, jet, turbo, or unknown.
- **Class:** The class to which the aircraft belongs. Classes are: heavy, large, or small.
- **Major:** This is the airline carrier that controls substitutions for the flight.
- **CDM Participant:** Indicates whether the flight belongs to an airline that participates in the FAA's Collaborative Decision Making program.
- **User:** The user class to which the aircraft belongs. User Classes are: air carrier, air taxi, air cargo, military, general aviation, and other.
- **Departure Information:** This includes the origin Airport and Center (Airport/Center), the Departure Fix and Estimated departure time (FIX/Estimate), and the Departure Procedure (Procedure), and Departure Procedure Transition (DTRSN).
- **GCD:** This field indicates the Great Circle Distance (GCD), which is the distance between the departure airport and arrival airport.

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- **Arrival Information:** Indicates the arrival Airport and Center, arrival Fix (AFIX) and Estimated arrival fix time (EAFT), and the standard terminal arrival route (STAR) and standard transition (STRSN).
- **ADL Element:** Indicates which ADL elements were used to derive the information in each column. For example, to display the flight's departure fix time, FSM uses the ADL element marked DFIX.
- **Gate, Runway, and En Route Times:** This section of the Flight Details window displays estimated, controlled, scheduled, proposed, airline, and actual times for several fields that allow you to track the flight's progress from the departure gate and runway to the destination runway and gate. The information includes the various times given for:
- **ETD/ETE/ETA:** Estimated Wheel Times
- **CTD/ETE/CTA:** Control Times
- **SGTD/SGTA:** Scheduled Gate Times
- **PGTD/ETE/PGTA:** Proposed Gate Times
- **LGTD/LRTD/LRTA/LGTA:** Airline Gate and Runway Times
- **IGTD/IGTA:** Initial Estimated Gate Times
- **ARTD/ETE/ARTA:** Actual Runway Times
- **OUT/OFF/ON/IN:** Time that the flight was out of the departure gate, off the departure runway, on the arrival runway, and in the arrival gate.
- **ERTD/ERTA:** Earliest Runway Times
- **OETD/ETE/OETA:** Original Estimated Wheel Times
- **BETD/BETA:** Beginning Estimated Wheel Times
- **OCTD/OCTA:** Original Control Times
- **Control Exempt/ Control Type/ Control Element:** Displays the type of controls on the flight resulting from a program.
- **Slot ID/Slot Hold:** The Slot ID is the currently assigned slot for the flight. Slot Hold indicates whether the slot is being held so that it will not be used in compression. A "Y" indicates the slot is being held. A dash (-) indicates the slot is not being held.
- **Diversion Recovery:** Indicates whether the flight is a diversion recovery leg of a previous flight.
- **Delay Status (ALD GDP FAD GSD TOD):** Indicates the type of delay, if any, on a flight.
- **LTOD -** If a flight is time out delayed, the length of time out delay is listed here.
- **CNX Status (UX FX RZ RS TO DV RM):** Indicates the cancellation status of the flight. The codes indicate how or why the flight was canceled.
- **Remark (NRP LFG III ATV SWP DVT ADC FCA WXR):** These codes indicate important information about the flight. NRP - National Route Program flight. LFG = Lifeguard flight. III = Category III flight. ATV = Altitude reservation. SWP = SWAP flight. DVT = Diversion recovery flight. ADC = Advise customs. FCA = Flow Constrained Area. WXR = Severe weather route.
- **Alarm Status (CC EC EA SF CF):** Indicates the type of alarm criteria, if any, that the flight meets.
- **Absolute Delay (Max [0, ETA - (IGTA - Taxi)]):** Absolute Delay is calculated to include all types of delay on a flight. This includes FAA and airline-imposed delay due to traffic management initiatives, mechanical delays, etc. Please note that delay can only be a positive integer. Therefore, if the flight is running as scheduled or is early, Absolute Delay will be a value of zero (0).

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- **Schedule Variation (ETA - [IGTA - Taxi]):** Schedule variation is almost identical to absolute delay with the exception that schedule variation can include negative values. A negative value in the Schedule Variation field indicates that the flight is running earlier than scheduled.
- **ATC Delay (Max [0, CTA - BETA]):** ATC Delay includes only that delay that results from an FAA traffic management initiative and any action taken by the airline as a result of the traffic management initiative. This does not include airline-imposed delay, such as mechanical failures, crew delay, etc. ATC Delay can only be calculated as a positive value. If the flight is running ahead of its schedule, ATC delay will be a value of zero (0).

Note: For a description of each of the flight data fields contained in the Flight Details window. See ADL Data Format or click **Help**>*ADL Data Elements* from the FSM Control Panel Component.

Flight Detail Menu

The menu bar in the Flight Detail component contains two options: **File** and **Help**.

1. **File Menu**

File > *Save as* - Saves the Flight Detail to a text file, which can be opened later and used again.

File > *Print* – Prints the Flight Detail information viewed on the monitor screen.

File > *Close* - Closes the Flight Detail window.

2. **Help Menu**

Help > *Flight Details* – Accesses the web-based on-line help for Flight Details information.

Viewing Problem Flights

In the air traffic community, operators need to identify which flights from their own operations may be contributing to delay and cancellation problems. Delays and cancellations, caused by Time Outs, occur when no activation message has been received within a certain time of the predicted departure time. Time Outs can be problematic when trying to manage air traffic. To help, FSM includes two reports for problem flights: Time Out Delay Report and Time Out Cancel Report. Report Lists can be grouped and sorted using the same methods as described previously in the Flight List section.

Time Out Delay Report

The Time Out Delay Report provides a quick picture of flights that are contributing to the Time Out delay problem. The report is in the same format as FSM Flight Lists and includes all flights whose delay status has been marked as 'TOD'. To view the Time Out Delay report, select an airport being monitored and then select **Reports** > *Time out Delay Report* option from the FSM *Control Panel* menu. The **Time Out Delay** report flight list will show all flights that have triggered the TOD alarm with the TOD checkbox selected (see Figure 6-31).

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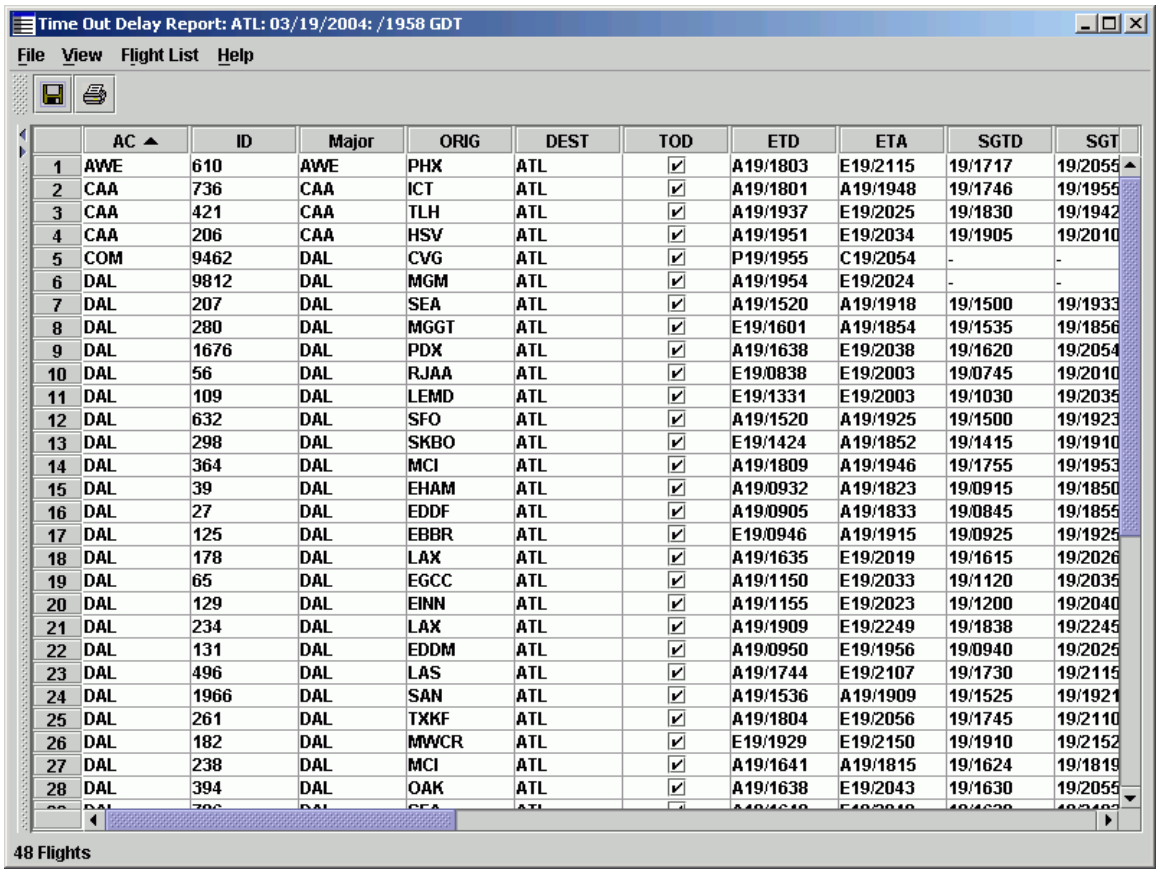

	AC	ID	Major	ORIG	DEST	TOD	ETD	ETA	SGTD	SGT
1	AWE	610	AWE	PHX	ATL	☑	A19/1803	E19/2115	19/1717	19/2055
2	CAA	736	CAA	ICT	ATL	☑	A19/1801	A19/1948	19/1746	19/1955
3	CAA	421	CAA	TLH	ATL	☑	A19/1937	E19/2025	19/1830	19/1942
4	CAA	206	CAA	HSV	ATL	☑	A19/1951	E19/2034	19/1905	19/2010
5	COM	9462	DAL	CVG	ATL	☑	P19/1955	C19/2054	-	-
6	DAL	9812	DAL	MGM	ATL	☑	A19/1954	E19/2024	-	-
7	DAL	207	DAL	SEA	ATL	☑	A19/1520	A19/1918	19/1500	19/1933
8	DAL	280	DAL	MGGT	ATL	☑	E19/1601	A19/1854	19/1535	19/1856
9	DAL	1676	DAL	PDX	ATL	☑	A19/1638	E19/2038	19/1620	19/2054
10	DAL	56	DAL	RJAA	ATL	☑	E19/0838	E19/2003	19/0745	19/2010
11	DAL	109	DAL	LEMD	ATL	☑	E19/1331	E19/2003	19/1030	19/2035
12	DAL	632	DAL	SFO	ATL	☑	A19/1520	A19/1925	19/1500	19/1923
13	DAL	298	DAL	SKBO	ATL	☑	E19/1424	A19/1852	19/1415	19/1910
14	DAL	364	DAL	MCI	ATL	☑	A19/1809	A19/1946	19/1755	19/1953
15	DAL	39	DAL	EHAM	ATL	☑	A19/0932	A19/1823	19/0915	19/1850
16	DAL	27	DAL	EDDF	ATL	☑	A19/0905	A19/1833	19/0845	19/1855
17	DAL	125	DAL	EBBR	ATL	☑	E19/0946	A19/1915	19/0925	19/1925
18	DAL	178	DAL	LAX	ATL	☑	A19/1635	E19/2019	19/1615	19/2026
19	DAL	65	DAL	EGCC	ATL	☑	A19/1150	E19/2033	19/1120	19/2035
20	DAL	129	DAL	EINN	ATL	☑	A19/1155	E19/2023	19/1200	19/2040
21	DAL	234	DAL	LAX	ATL	☑	A19/1909	E19/2249	19/1838	19/2245
22	DAL	131	DAL	EDDM	ATL	☑	A19/0950	E19/1956	19/0940	19/2025
23	DAL	496	DAL	LAS	ATL	☑	A19/1744	E19/2107	19/1730	19/2115
24	DAL	1966	DAL	SAN	ATL	☑	A19/1536	A19/1909	19/1525	19/1921
25	DAL	261	DAL	TXKF	ATL	☑	A19/1804	E19/2056	19/1745	19/2110
26	DAL	182	DAL	MWCR	ATL	☑	E19/1929	E19/2150	19/1910	19/2152
27	DAL	238	DAL	MCI	ATL	☑	A19/1641	A19/1815	19/1624	19/1819
28	DAL	394	DAL	OAK	ATL	☑	A19/1638	E19/2043	19/1630	19/2055

Figure 6-31: Time Out Delay (TOD) Report Flight List

The displayed information will default to arrival data. To view departure data, select **View** > *Departure Data* checkbox in the drop down menu.

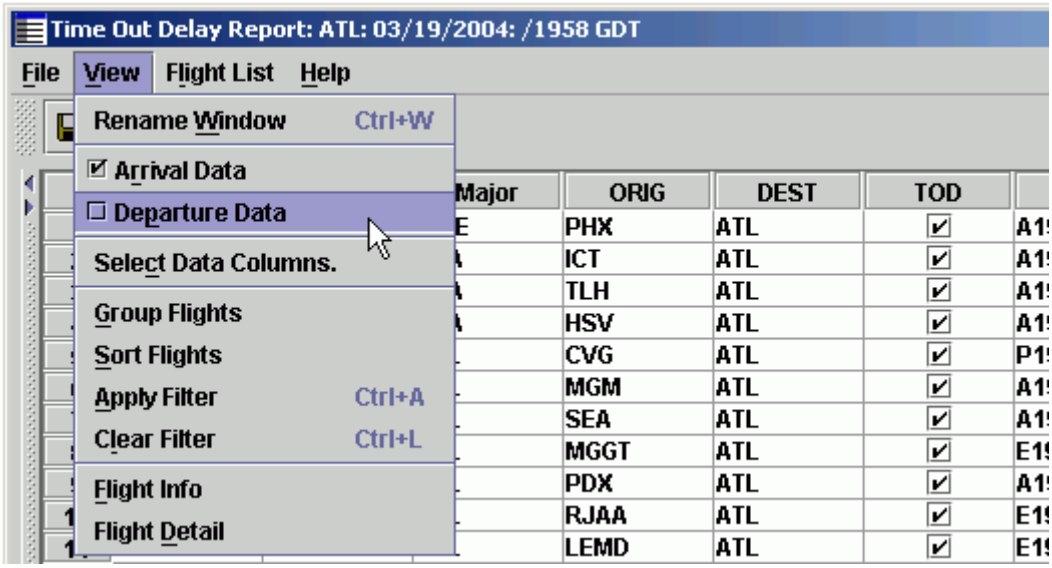

Figure 6-32: TOD Delay Report with Departure Data

The Time Out Delay report will display both arrival and departure data. To alternate information in the report you can check or uncheck the arrival or departure boxes.

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Time Out Cancel Report

The Time Out Cancel Report provides a quick picture of flights, from your operation, which are contributing to the Time Out cancel problem. The report is in the same format as FSM Flight Lists and includes all flights whose cancellation status is Time Out Cancelled (ToCnx). To view the Time Out Cancel report select a monitored airport and then select **Reports** > *Time Out Cancel Report* option from the FSM *Control Panel*. The Time Out Cancel report will show all flights that have triggered the ToCnx alarm and the ToCnx checkboxes will be selected for all flights included in the report. The Time Out Cancelled report format is identical to the Time Out Delayed report as shown previously in Figure 6-31.

The displayed information will default to arrival data. Select the **View** > *Departure Data* checkbox to view Departure Data in the Flight List. The Time Out Cancel Report will then display both arrival and departure data. To alternate information in the report you can check or uncheck the arrival or departure boxes.

Other Flight Reports

Flight reports in FSM are a good way to view a set of flights arriving at an airport that meet specific criteria. All reports lists can be accessed from the **Reports** menu on the *Control Panel* component.

Priority Flight Report

This report identifies "priority" flights. It is similar to an FSM Flight List, but only lists those flights tagged as Lifeguard (LFG) or Diversion Recovery (DVT) flights. To view a Priority Flight Report, select the monitored airport you wish to view the report for and then select **Reports >** *Priority Flights* from the FSM *Control Panel* component. Any flights that have the LFG or DVT checkboxes marked will appear on the Priority Flight Report.

Slot Hold Report

The Slot Hold Report lists all currently held slots. This report is similar to an FSM Flight List, but only lists those flights whose slot hold flag is set to ‘Y’as shown in Figure 6-33. To view a Slot Hold Report, select the monitored airport you wish to view the report for and then select **Reports** > *Slot Hold Report* in the FSM *Control Panel* component.

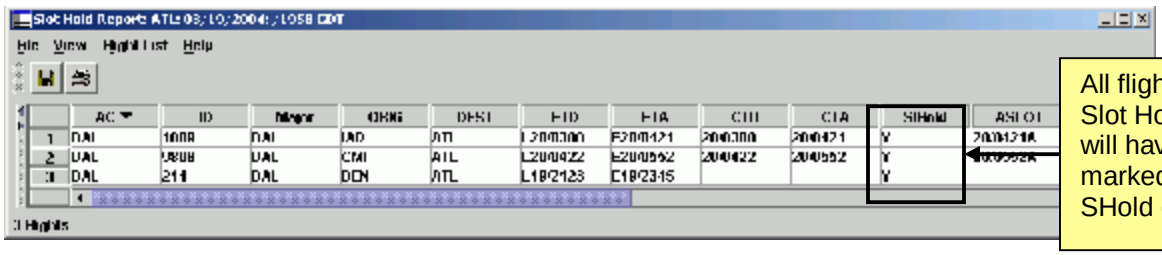

Figure 6-33: Slot Hold Report

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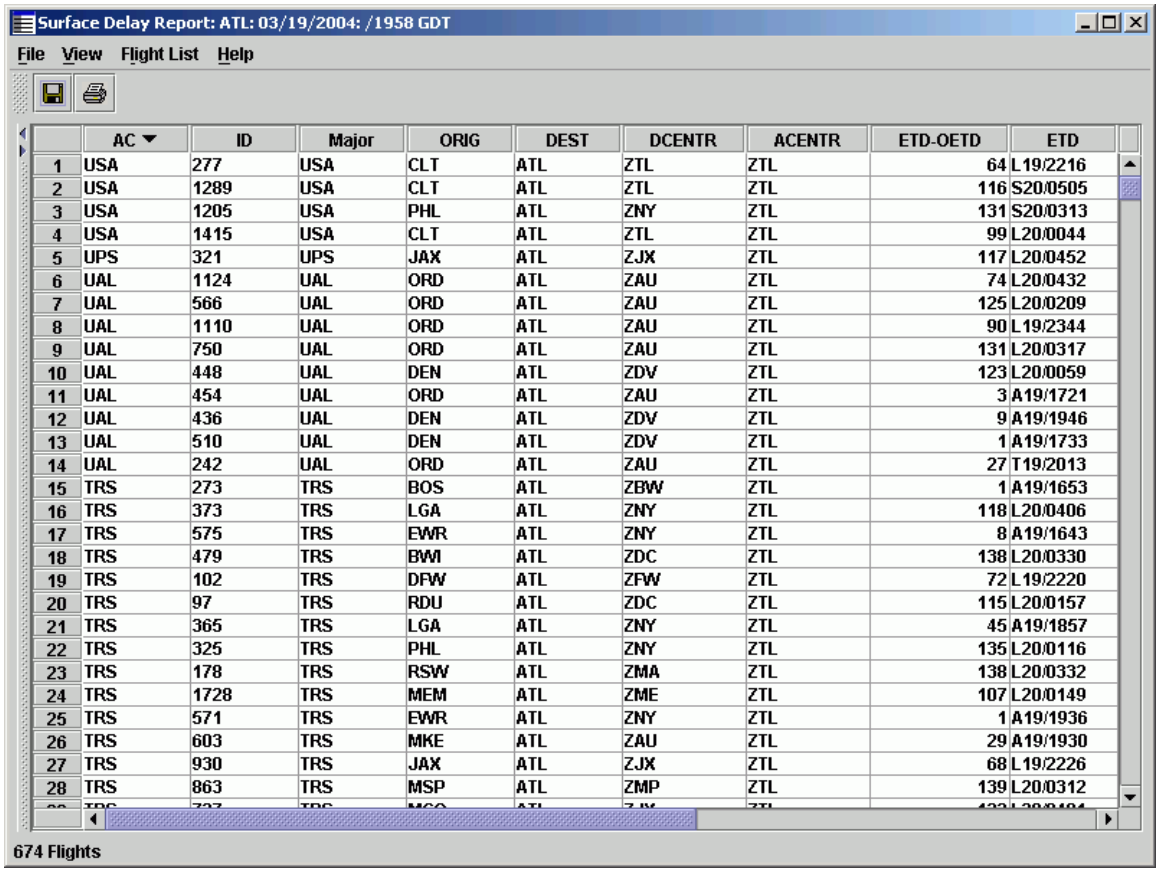
The displayed information will default to arrival data. To view departure data select **View** and the *Departure Data* checkbox in the drop down menu. The Slot Hold Report will then display both arrival and departure data. To alternate information in the report you can check or uncheck the arrival or departure boxes.

Surface Delay Report

The Surface Delay Report indicates the ground delay imposed on flights and contains departure information for both arriving and departing flights. To view a Surface Delay Report, select the monitored airport you wish to view the report for and then select **Reports** > *Surface Delay Report* from the FSM *Control Panel* component.



	AC	ID	Major	ORIG	DEST	DCENTR	ACENTR	ETD-OETD	ETD
1	USA	277	USA	CLT	ATL	ZTL	ZTL	64	L19/2216
2	USA	1289	USA	CLT	ATL	ZTL	ZTL	116	S20/0505
3	USA	1205	USA	PHL	ATL	ZNY	ZTL	131	S20/0313
4	USA	1415	USA	CLT	ATL	ZTL	ZTL	99	L20/0044
5	UPS	321	UPS	JAX	ATL	ZJX	ZTL	117	L20/0452
6	UAL	1124	UAL	ORD	ATL	ZAU	ZTL	74	L20/0432
7	UAL	566	UAL	ORD	ATL	ZAU	ZTL	125	L20/0209
8	UAL	1110	UAL	ORD	ATL	ZAU	ZTL	90	L19/2344
9	UAL	750	UAL	ORD	ATL	ZAU	ZTL	131	L20/0317
10	UAL	448	UAL	DEN	ATL	ZDV	ZTL	123	L20/0059
11	UAL	454	UAL	ORD	ATL	ZAU	ZTL	3	A19/1721
12	UAL	436	UAL	DEN	ATL	ZDV	ZTL	9	A19/1946
13	UAL	510	UAL	DEN	ATL	ZDV	ZTL	1	A19/1733
14	UAL	242	UAL	ORD	ATL	ZAU	ZTL	27	T19/2013
15	TRS	273	TRS	BOS	ATL	ZBW	ZTL	1	A19/1653
16	TRS	373	TRS	LGA	ATL	ZNY	ZTL	118	L20/0406
17	TRS	575	TRS	EWR	ATL	ZNY	ZTL	8	A19/1643
18	TRS	479	TRS	BWI	ATL	ZDC	ZTL	138	L20/0330
19	TRS	102	TRS	DFW	ATL	ZFW	ZTL	72	L19/2220
20	TRS	97	TRS	RDU	ATL	ZDC	ZTL	115	L20/0157
21	TRS	365	TRS	LGA	ATL	ZNY	ZTL	45	A19/1857
22	TRS	325	TRS	PHL	ATL	ZNY	ZTL	135	L20/0116
23	TRS	178	TRS	RSW	ATL	ZMA	ZTL	138	L20/0332
24	TRS	1728	TRS	MEM	ATL	ZME	ZTL	107	L20/0149
25	TRS	571	TRS	EWR	ATL	ZNY	ZTL	1	A19/1936
26	TRS	603	TRS	MKE	ATL	ZAU	ZTL	29	A19/1930
27	TRS	930	TRS	JAX	ATL	ZJX	ZTL	68	L19/2226
28	TRS	863	TRS	MSP	ATL	ZMP	ZTL	139	L20/0312

Figure 6-34: Surface Delay Report

The displayed information will default to arrival data. To view departure data select **View** and the *Departure Data* check box in the drop down menu. The Surface Delay Report will then display both arrival and departure data. To alternate information in the report you can check or uncheck the arrival or departure boxes.

Query Manager Flight Lists

The *Query Manager* component can query an airport and generate a Flight List that contains only flights that meet certain criteria. The *Query Manger* can be accessed by

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selecting the **Show Query Manager** button or use CTRL + Q on the FSM *Control Panel* component. From the *Query Manger*, select any one of the *Built-in or User-defined Filters* then press the **Flight List** button or select **View** > *Flight List* from the *Query Manager* menu.

> **Note:** If you do not have a data set (airport) selected, FSM displays a "No Active Data Sets" error message.

The generated Flight List will contain only those flights that meet the selected criteria. For more detail on how to view and utilize flight filters in Query Manager, see Chapter 3: Query Manager.

Compliance Flight Lists

When any flight becomes noncompliant, FSM generates a flight list that includes these flights. The compliance reports can be accessed from the **Reports** > *Compliance* > option from the main *Control Panel* component menu. There are five possible compliance reports: By CTD, By ETE, By CTA, Spurious Flight, and Cancelled That Flew Compliance.

To view flights contained in the compliance reports select the compliance option from the **Reports** > *Compliance* menu option. For example, if you select **Reports** > *Compliance*> *By CTA* the Flight List, which contain non-compliant alarm columns, all flights that have noncompliant CTAs will be listed with the FltAlarm CC checkboxes checked. If the flight has additional alarms (non-compliant) associated with it, those alarm checkboxes will also be checked. Figure 6-35 is an example of CTA Compliance Alarm Flight List.

> **Note:** Alarm Flight Lists will only include those flights arriving at the selected airport.

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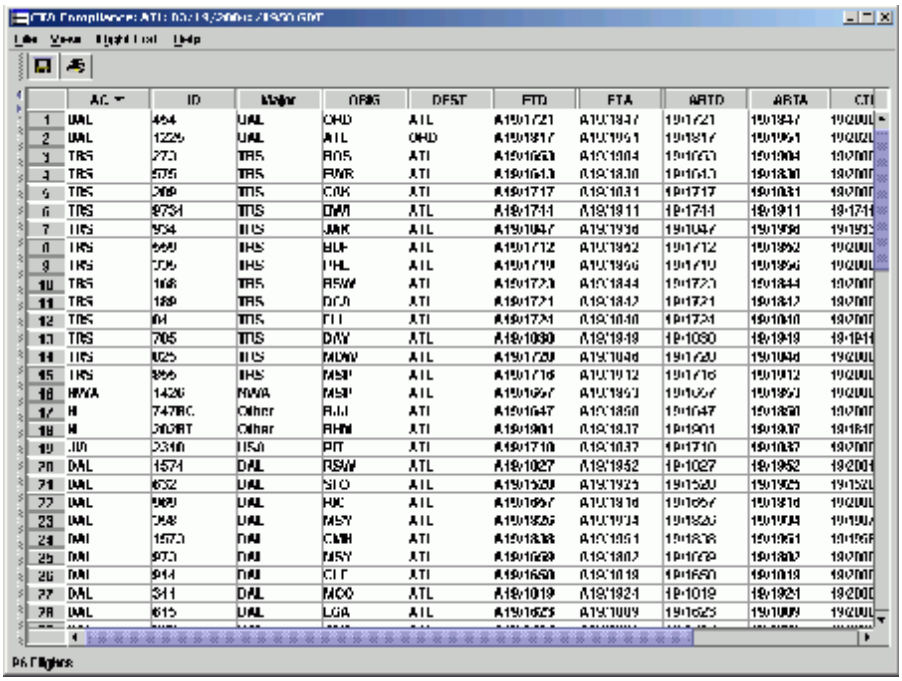

Figure 6-35: CTA Compliance Alarm Report

To view the Compliance alarm columns on the generated report, select the alarm(s) from the **View** > *Select Data Columns* window. If a flight is non-compliant, the checkbox under the Alarm type will be selected. The Compliance Alarm columns are defined below:

1. **CC** – These flights violated their CTA Compliance. Flights arriving more than 5 minutes before or more than 5 minutes after their Control Time of Arrival (CTA).
2. **EC** – These flights violated their CTD Compliance. The departure boundaries are more than 5 minutes before or more than 5 minutes after their estimated departure clearance time. Any flight, which has an ARTD of 5 minutes earlier or 5 minutes later than the most recent EDCT, will be included in the CTD Compliance report.
3. **EA** – These flights violated the Actual ETE vs. Original ETE alarm. vs. Original ETE compliance. This Alarm is generated when the difference between the ETE estimated by ETMS and actual flight time is greater than a specified value, but the flight status is not "cancelled." The default value is 15 minutes. ETMS estimates ETE using OCTA - OCTD. Actual flight time is calculated using ARTA -ARTD.
4. **SF** - This alarm detects the cancellation of a false flight used to ignite a substitution stream. Flights submitted as SI cancellations with no corresponding entries in the OAG will trigger the Spurious Flights Alarm.
5. **CF** – This alarm detects any flights that were cancelled but later flew without the flight being reinstating properly.

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7 Viewing Airport Demand

Introduction

You already know that FSM displays flight information in several ways. But in order to make traffic management decisions, you must also be able to view the overall demand on the airport. Airport demand is made up of the total flights using the airport for arrival and departure. The main utilities to view total airport demand are the FSM *Bar Graph* components and Count List Reports from the *Control Panel* component. The FSM *Bar Graphs* constantly display airport demand information as it is received through ADLs. The Count List Reports are broken down into seven different options, depending on your needs. With these tools, monitoring airport demand is easy.

Dynamic Graphs

About the Stacked Dynamic Graph

The *Current Demand* "stacks" its data according to the coloring tab currently displayed. For example, if the tab option opened is **Arrival Status**, the bars in the graph will be colored according to the percentage of flights that represent each respective arrival status. If half of the flights for one time period have not departed (light green), while the other half are in the air (red), the bar for that hour will be half red/half green. If every flight for the hour has already landed, the bar for that hour will be black. The graph is dynamic and changes according to the information in each ADL update. The graph also automatically updates itself when you choose a different color tab option.

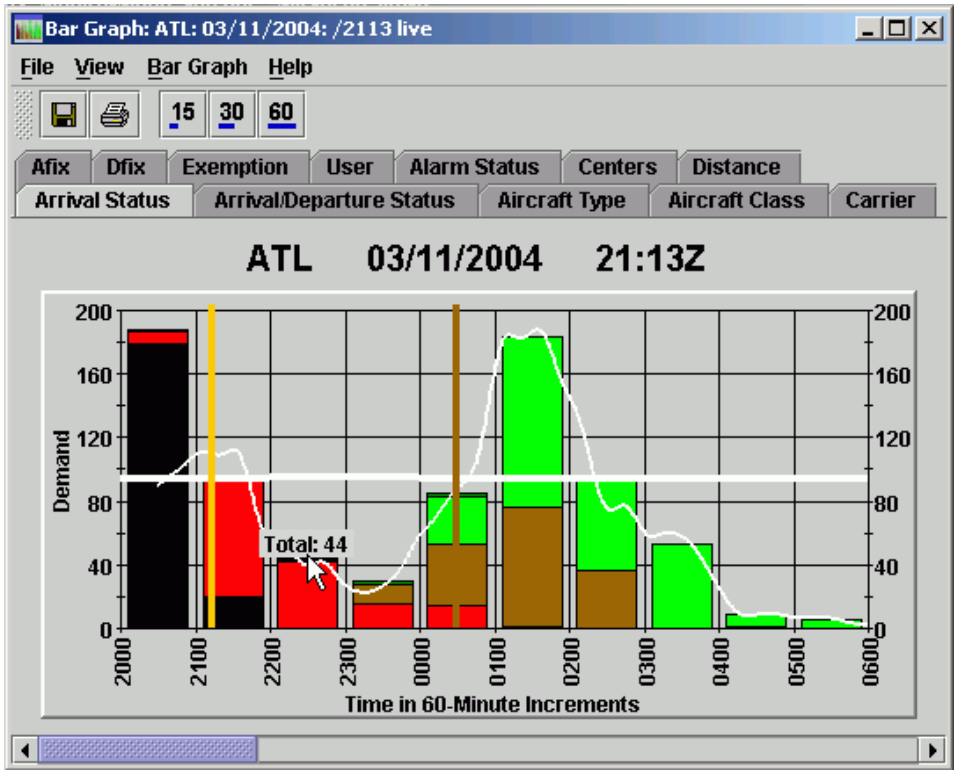

Figure 7-1: Bar Graph displaying Color by Arrival Status Tab

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About the Display

There are 12 different coloring options to view the demand. The **Arrival Status** tab is the default view when a *Bar Graph* Component is initially opened. The airport, date, time, and data mode are displayed in the title bar. The airport, date, and last ADL update time is also displayed just below the color tabs. Flight color is a feature in FSM that assists the user to distinguish between the varying statuses of each displayed flight. Flight color is displayed in the following 12 tabs of the *Bar Graph* component: By **Arrival Status, Arrival/Departure, Aircraft Type, Aircraft Class, Carrier, AFix, DFix, Exemption, User, Alarm Status, Centers, and Distance**. The bar graph displays the arrival flow rate by default. This thin, white line represents the airport arrival flow independent of the time-bin convention.

Arrival vs. Departure Bars on the Graph

The *Bar Graph* will default only to arrival data in the Monitored Live mode. When you are viewing arrival data in FSM, the bars on the graphs will be solid. Both Arrival and Departure data can be toggled on and off using the Arrival Data and Departure Data options from the *Bar Graph* **View** menu. To view Departure Data select **View** > *Departure Data* checkbox (see Figure 7-2 below).

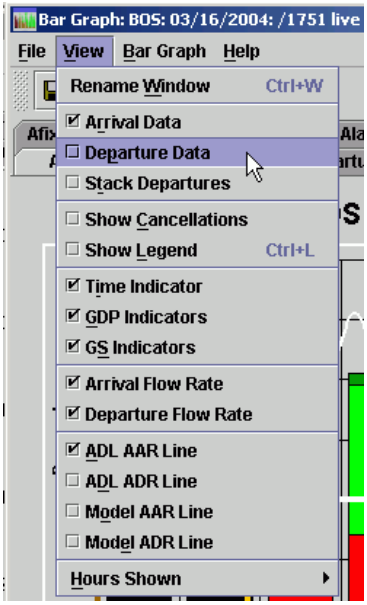

Figure 7-2: Toggle Arrival and Departure Data on/off

When both the *Arrival Data* and *Departure Data* checkboxes are selected from the **View** menu, the *Bar Graph* displays arrival and departure data simultaneously. When viewing both arrival and departure data, you will see two bars for each time increment. Bars that represent arrival data will be solid, while bars that represent departure data will be hashed. When departure data is displayed, the departure flow rate is represented by the thin, cyan line.

Selecting **View** > *Stack Departures* stacks departure data on top of the arrival data. The Stack Departures option will create one bar on the graph for each time increment that

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represents the sum of both the arriving and departing flights. The departing flights will be hashed while the arriving flights will be solid in color, as shown in Figure 7-3 below.

Figure 7-3: Stacked Arrival/Departure Information

Original vs. Modeled Data Bars on the Graph

In GDT Mode the *Bar Graph* always displays both solid and hashed bars. Solid bars represent the original data, while hashed bars represent modeled data.

Show Canceled Flights

Canceled flights are not displayed by default in the Graph. To view canceled flights in the *Bar Graph* select the **View** > *Show Cancellations* checkbox. Canceled flights will appear in cyan at the top of each hour bar. Showing canceled flights is useful to compare the original airport demand with the demand after cancellations. To hide canceled flights, uncheck the **View** > *Show Cancellations* checkbox.

Show Legend

The *Bar Graph* Legend indicates the color key according to each respective flight status for each color Tab. To view/hide the legend select **View** > *Show Legend* checkbox or press CTRL + L on your keyboard to toggle the Legend on and off.

Changing the Time Increments Display

When the *Bar Graph* component opens, the default time increment to display capacity and demand information is 60-minutes. To view this information in 15-minute or 30-minute time increments click the associated quick button from the Bar Graph (see Figure 7-4 below). When the time increment is changed on the *Bar Graph*, the demand numbers

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listed on the Y-axis of the graph will change accordingly. For example, if the AAR of 32 displays for 60-minute time increments, a 30-minute time increment for the same information displays an AAR of 16.

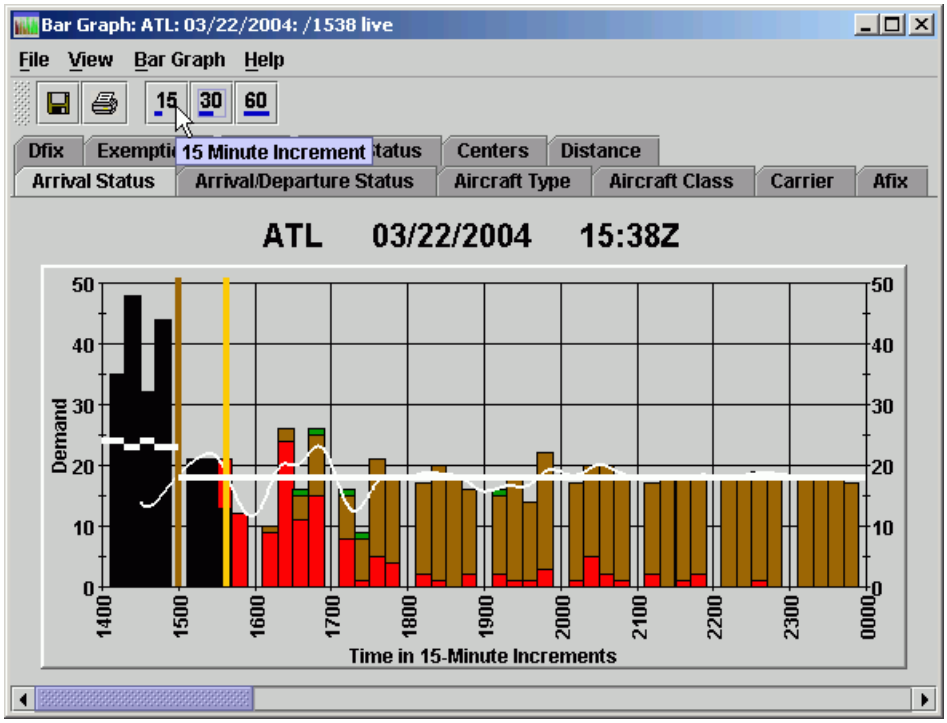

Figure 7-4: 15-Minute increment display

Show More/Less Hours

The FSM default displays 10 hours of data in the *Bar Graph*. You can specify the number of hours displayed in the bar graph to view more or less flight data. For example, you may want to view the demand in 15-minute time increments, which is difficult to see on a graph with 10 hours worth of data. To change the number of hours in the *Bar Graph*, select **View** > *Hours Shown* > *X* (X = number of hours). The graph will automatically update itself to show the amount of hours you specify. You can also scroll the *Bar Graph* screen using the scroll bars at the bottom of the component to view more hours into the future.

Tracking Time

Like the FSM *Time Line*, the *Bar Graph* component also tracks time. The Time Indicator is an orange vertical line that remains fixed at the current time. To show/hide the time indicator select **View** > *Time Indicator* on your keyboard to toggle the time indicator on or off.

By default, the *Bar Graph* updates with each hour. Keeping the **Bar Graph** > *Track Time* checkbox checked with move the bar at the turn of each hour. When the box is not checked, the bars will not move, but the orange Time Indicator still displays the current time on the graph.

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Track GDP/GS Hours

You can view the hours of a GDP or Ground Stop in effect at the airport you are monitoring by using the *Bar Graph.* The *Bar Graph* has optional program indicators that work like the Time Indicator to show the start and end times of a current GDP or Ground Stop. The GDP Time indicators are colored brown and the GS Time indicators are colored yellow. The program time indicators appear automatically when a program goes into effect at the monitored airport. To toggle the program indicators, select **View** > *GDP Indicators* or > *GS Indicators.* When the GDP or GS option is checked, the program time indicators will appear in the graph. When the options are not checked, program time indicators will not display.

View the AAR and ADR

The white horizontal line that runs through the graph represents the *Airport Arrival Rate (AAR)* for the monitored airport. The *ADL AAR*, which shows up by default, is a fixed AAR sent by the FAA Air Traffic Control System Command Center to advise of the number of arriving aircraft an airport can accommodate at any given interval of time. The AAR changes according to the interval of time being displayed. For example, an AAR of 60 per hour is equal to an AAR of 15 per quarter hour. To toggle the ADL AAR Line on/off select/unselect the **View** > *ADL AAR Line* checkbox from the *Bar Graph* menu.

A cyan horizontal line runs through the *Bar Graph* representing the *Airport Departure Rate (ADR)* for the monitored airport. The *ADL ADR* is a fixed value sent by the FAA Air Traffic Control System Command Center to specify the number of departing aircraft an airport can accommodate at any given interval of time. By default the *ADL ADR* is not displayed. To view the *ADL ADR Line* select the **View** > *ADL ADR Line* checkbox. The ADR also changes according to the time increment used in the graph display. For example, an ADR of 60 per hour is equal to an ADR of 15 per quarter hour.

> **Note:** Departure information is not available in GDT Mode; therefore ADR options are removed from the GDT *Bar Graph.*

Changing the AAR/ADR

Only ATCSCC users can change the actual *ADL AAR* or *ADL ADR* (the rate used in Volpe ADLs which reflects real operational data). For ATCSCC users, see Chapter 3: Control Panel component for details on how to Modify AAR/ADR rates. However, other users can model the effects of various AARs and ADRs by using the Model function.

Selecting **View** > *Model AAR Line* checkbox from the *Bar Graph* displays the user-specified AAR as a dashed white line. Selecting **View** >*Model ADR Line* checkbox displays the user-specified ADR as a dashed cyan line. *Model AAR* can be used for modeling and analysis, changing it according to your needs.

> **Note: View** > *Model AAR/ADR Line* checkbox must be checked to view the modeled rates.

Changing the AAR/ADR

Before modeling the AAR/ADR, make sure that **View** > *Model AAR/ADR Line* checkbox is selected, otherwise your modeled rates will be hidden from view. If the ADL

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AAR/ADR is displayed on the *Bar Graph*, the dashed line (for modeling) will appear in the same position as the ADL AAR.

There are two methods to change your modeled AAR/ADR:

1. Use your mouse to drag the dashed line in the graph to the desired rate. The dashed line will move to the AAR/ADR you specified. Note that only the portion of the line to the right of the cursor will move. Any portion of the line to the left of your cursor should remain in the same position as you drag the line to a new AAR. Moving the AAR/ADR from the graph will also automatically fill in the Specify AAR/ADR window.
2. Select **Bar Graph** > *Model Arrival Rates* > *Specify* or **Bar Graph** >*Model Departure Rates* > *Specify*. This will display the Specify Model AAR window, fill in the modified AAR/ADR and the new rates will be displayed on the *Bar Graph*. Refer to <Specify Model AAR/ADR> for more information on changing the AAR from Specify AAR/ADR window.

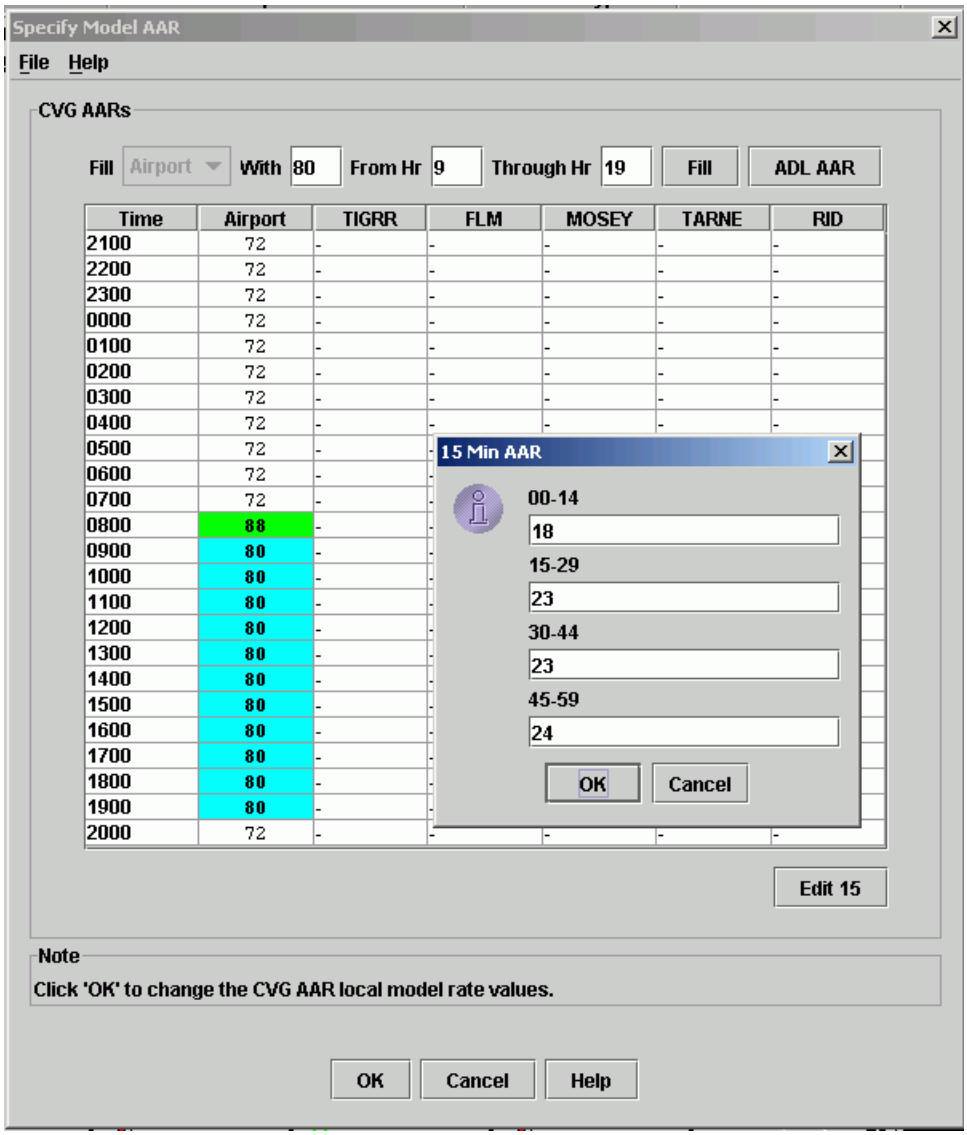

Figure 7-5: Specify Model AAR Window

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To restore the Model AAR/ADR rates to its original value select **Bar Graph** > *Model Arrival Rates* > *Reset* or **Bar Graph** > *Model Departure Rates* > *Reset.* You can also click the **ADL AAR/ADR** button from the Specify Model AAR/ADR window to reset the rates to the current ADL value and the Model line should disappear behind the ADL AAR/ADR rates.

Demand Counts

Count Lists give you the option to check the flights that make up arrival and/or departure demand for each hour. All Count Lists can be opened from the FSM *Control Panel* component. There are 7 count list reports to choose from: By Demand, By Center, By Aircraft Type, By Aircraft Weight, By Arrival Fix, By Departure Fix, and By User. To view a demand count for a particular monitored airport, first select the airport to view the demand count that you wish to view, and then select **Reports > Counts** > *By report type.* If no airport is selected, FSM will display an error message that indicates "No Current Data Set" is selected. See Figure 7-6 below. .

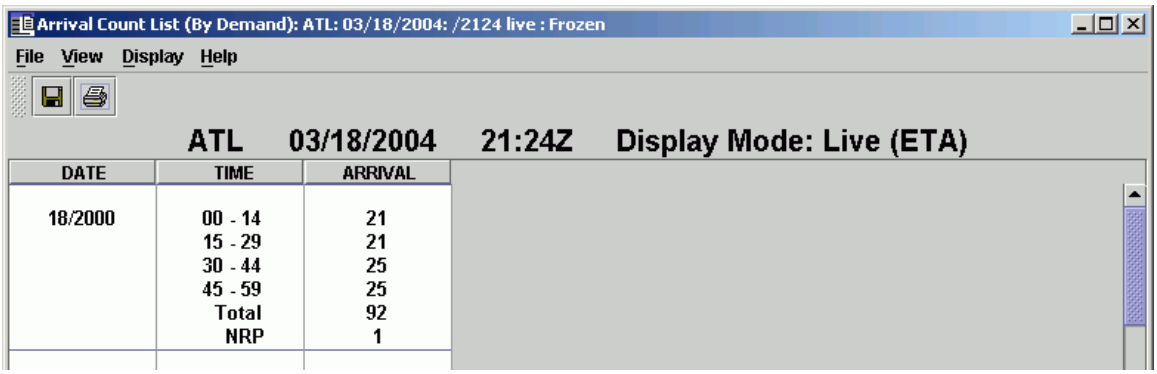

Figure 7-6: Count List By Demand

Note: Count Lists in GDT Mode only show counts for arriving flights.

Viewing the Count List

After selecting the type of demand count, a Count List window will appear. The type of Count List is listed in parentheses in the Count List window's title bar. The three-letter airport code, Date, ADL Time the list was generated, and display mode are displayed in the title bar as well as above the Count List columns.

Each count list is arranged in 15-minute intervals with totals for each hour based on the FSM *Time Line* component. NRP (National Route Plans) counts are also listed below the total count for each hour. An NRP is a flight that has filed for a more direct route, but is considered to be a preferred route (as designated by the FAA). In Monitor Mode, counts are displayed based on flight's ETA by FSM default. Count Lists can be viewed based on the Count List **Display** menu options: by ETA, BETA, IGTA - Taxi, OCTA, CTA, EFTA, DEPARTURE, and ARRIVAL/DEPARTURE, as shown in Figure 7-7.

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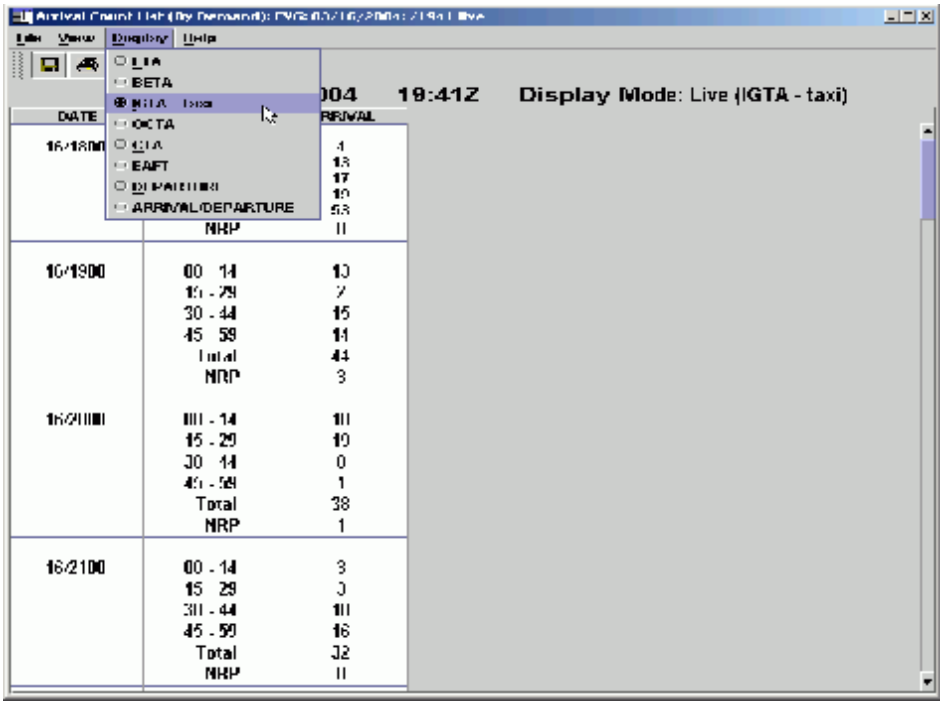

Figure 7-7: Count List Display Data

To increase the size of any Count List window, drag the edge of the window with your mouse. When the information contained in the window is too large for the window, you can scroll through the data by dragging the scroll bars located at the bottom and right hand side of the window.

Count List Menu

The Count Lists each have four menu options (with the exception of Departure Fix): File, View, Display and Help.

1. **File Menu**

File > *Save as* - Allows you to save the Count List to a file and open it later in a text file.

File > *Print* - Allows you to send the Count List to a printer and view a hard copy of the Count List.

File > *Close* - Will close and quit the Count List component without taking any action.

2. **View Menu**

View > *Freeze Data* – Will freeze the count list data at the time the option is selected, otherwise the Count List will update with each new ADL.

3. **Display Menu**

Display > *ETA* – Displays counts based on the flights Estimated Time of Arrival.

Display > *BETA* – Displays counts based on the flights Beginning Estimated Wheel Time.

Display > *IGTA* – Taxi – Displays counts based on the flights' Initial Estimated Gate Time Arrival – Taxi.

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Display > *OCTA* – Displays counts based on the flights' Original Control Time Arrival.

Display > *CTA* – Displays counts based on the flights' Control Time of Arrival.

Display > *EAFT* – Displays counts based on the flights' Estimated Fixed Time of Arrival.

Display > *DEPARTURE* – Displays counts based on the Departure flights.

Display > *ARRIVAL/DEPARTURE* – Displays counts based on Arrival and Departure flights.

4. **Help Menu**

Help > *Counts* – Accesses the web-based on-line help for Count Lists.

Note: The Counts by Departure Fix does not have a Display Menu.

Count List by Demand

Reports > **Counts** > By *Demand* - Displays arrival demand in 15-minute interval flight counts and totals the flight count for each hour. This acts as a quick check of the arrival demands in each hour. See Figure 7-8 below.

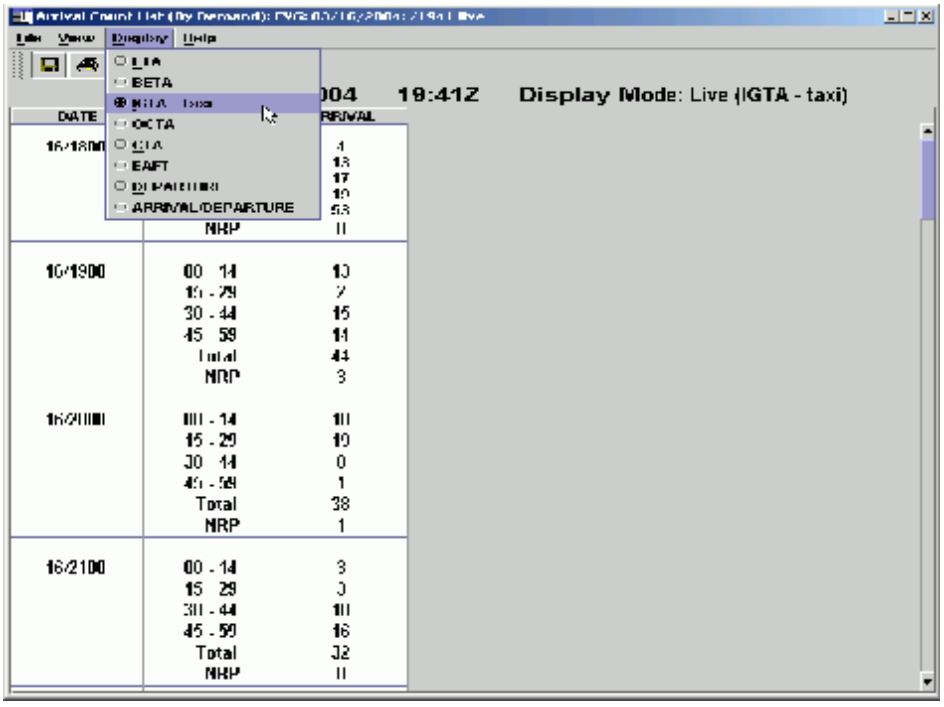

Figure 7-8: Counts by Demand

Counts by Centers

Reports > **Counts** > *By Centers* - Provides flight counts according to departure centers. There are 20 centers for this particular display (Figure 7-9). If the three-letters "ZZZ" are shown, they represent any center that is not part of the other 20.

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Again, in Monitor Mode, these counts are based on flights' ETA times, as displayed in the FSM Time Line.

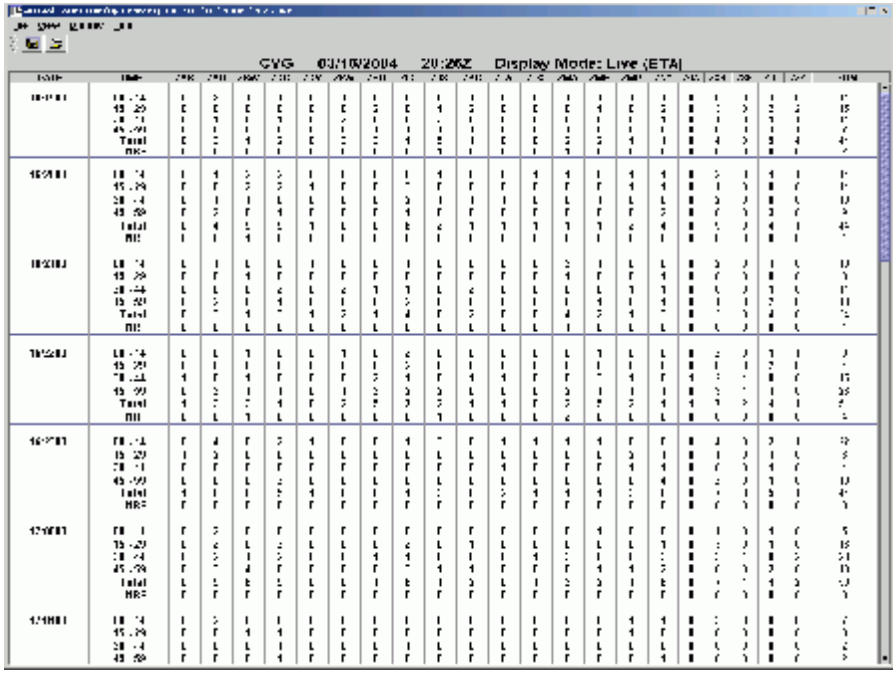

Figure 7-9: Counts by Centers

Counts by Aircraft Type

Reports > **Counts** > *By Aircraft Type* - Displays a count list based on the aircraft type. Aircraft types are classified the same way as in the FSM By Aircraft Type option. That is, they are classified according to aircraft type as specified by the manufacturer.

Counts by Aircraft Weight

Reports > **Counts** > *By Aircraft Weight* - Provides flight counts according to the aircraft weight. This Count List incorporates the same classifications for aircraft weight as FSM's By Aircraft Weight menu option.

Counts by Arrival Fix

Reports > **Counts** > *Arrival Fix* - Provides flight counts according to the arrival fix each flight is arriving at for the monitored airport. Arrival fix names for each airport vary. FSM automatically generates the correct Arrival Fix names for the monitored airports and uses them in the Count List headings.

Counts by Departure Fix

Reports > **Counts** > *By Departure Fix*- Provides flight counts according to the departure fix each flight is arriving at for the monitored airport. Departure fix names for each airport vary. FSM automatically generates the top 11 departure fixes for the monitored airport and uses them in the Count List headings. If the departure fix is other than these 11 or is unknown, the flight will be listed under the "Other" column.

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Counts by User

Reports > **Counts** >*By User* - Provides a flight count according to the classification of the aircraft (Figure 7-10).

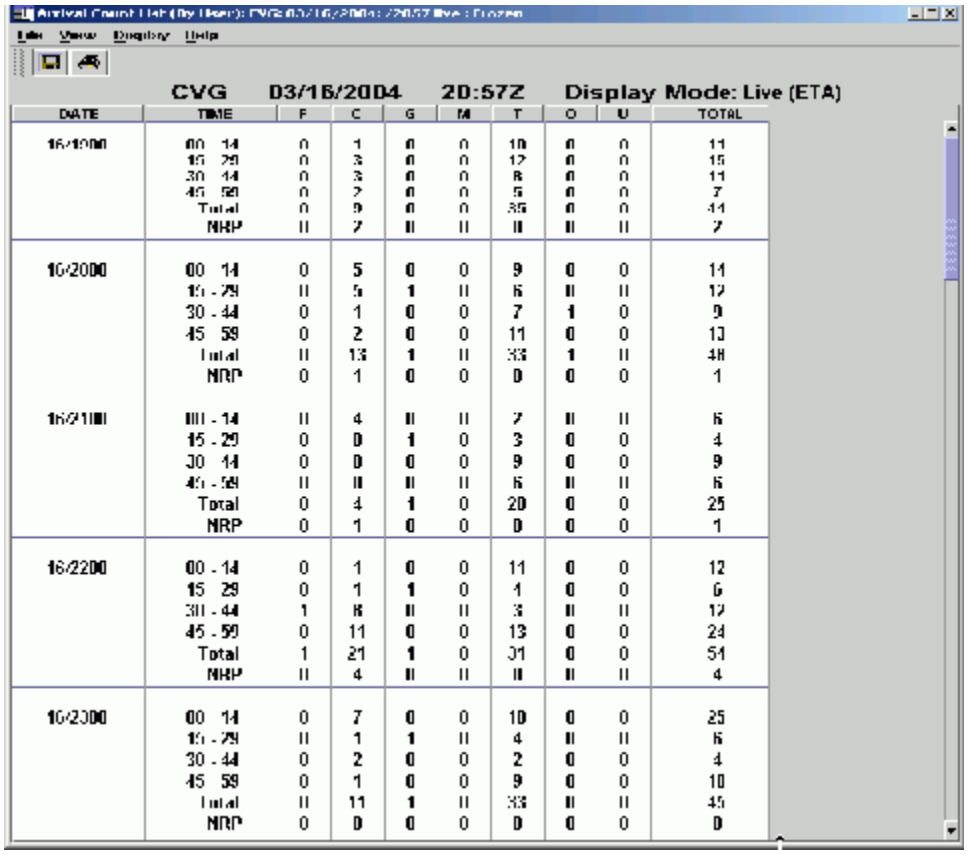

Figure 7-10: Counts by User

The Arrival Count List by User classifies flights according to their function in the NAS. There are 7 types of users in FSM:

C - Air Carriers

T - Air Taxi

F – Freight/Cargo Carriers

M - Military

G - General Aviation

O - Other - This class includes flights that do not belong to one of the five categories listed above.

U - Unknown - This category is reserved for flights which may fall into a user category, but whose classification is not known in FSM.

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8 Decision Support Tools

What are Modeling Tools?

Modeling tools are functions in FSM that aid users in looking at various operational or traffic scenarios. You can use modeling tools to analyze existing operations and previous days' events. There are several modeling tools inherent with FSM functions, such as the Power Run Tab found in FSM's Ground Delay Program Setup; however, they are not discussed in this chapter. This chapter reviews some of the utilities in FSM specifically set up to help you model various air traffic scenarios that can also be pulled up at any time during your FSM session.

Is a TMI Necessary?

Adverse weather or any other significant airport event can decrease the airport's capacity, which lowers the AAR. When the airport's arriving flight demand exceeds the airports AAR capacity, then a Traffic Management Initiative (TMI) may be essential.

FSM allows you to model different scenarios in Ground Delay Tools (GDT) Mode to help you determine what type of TMI would be most effective. Either a Ground Delay Program or Ground Stop, or in some cases both may be necessary.

Evaluating Demand versus Capacity

Bar Graph: The *Bar Graph* component is colored according to the tab option currently in use. For example, if Arrival Status tab is in focus, the bars in the graph will be colored according to the percentage of flights that represent each respective arrival status. If half of the flights for one time period have not departed (light green), while the other half are in the air (red), the bar for that hour will be half red/half green. If every flight for the hour has already landed, the bar for that hour will be black. The *Bar Graph* is dynamic and changes according to the information in each ADL update. The *Bar Graph* also automatically updates itself when you choose a different tab option. The Bar Graph serves as a quick look to see if demand exceeds the airport's capacity. The arrival flow rate displays the airports demand independently of the time-bin conventions. Therefore, you can view where the fluctuations in demand are located within each hour. If there are several hours where demand is significantly greater than the AAR, a TMI may be needed to control the traffic flow into the airport.

Time Line: The *Time Line* component is also colored according to the tab option currently in use. The default colors can be viewed from the *Time Line's* legend. See *Chapter 3: Time Line* for more information. At the top of each hour column in the *Time Line* the airports AAR and expected demand for that hour is listed. For example 72/86 indicates that the AAR is 72 and the demand expected for that hour is 86 (see Figure 8-1). There are situations where demand exceeds capacity in one hour but the next hour has plenty of room to accommodate the spill over from the previous hour. In these instances, a TMI would be unlikely. Figure 8-1 shows an AAR of 72 for an airport. At 1600z, the demand expected is 86; therefore, the demand exceeds the capacity by 14 flights. At first glance this seems excessive, but looking into the next hour, the expected demand is only

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58. The 16 flights from the 1600z hour can be accommodated in the 1700z hour. A TMI is more likely when demand exceeds capacity for several hours.

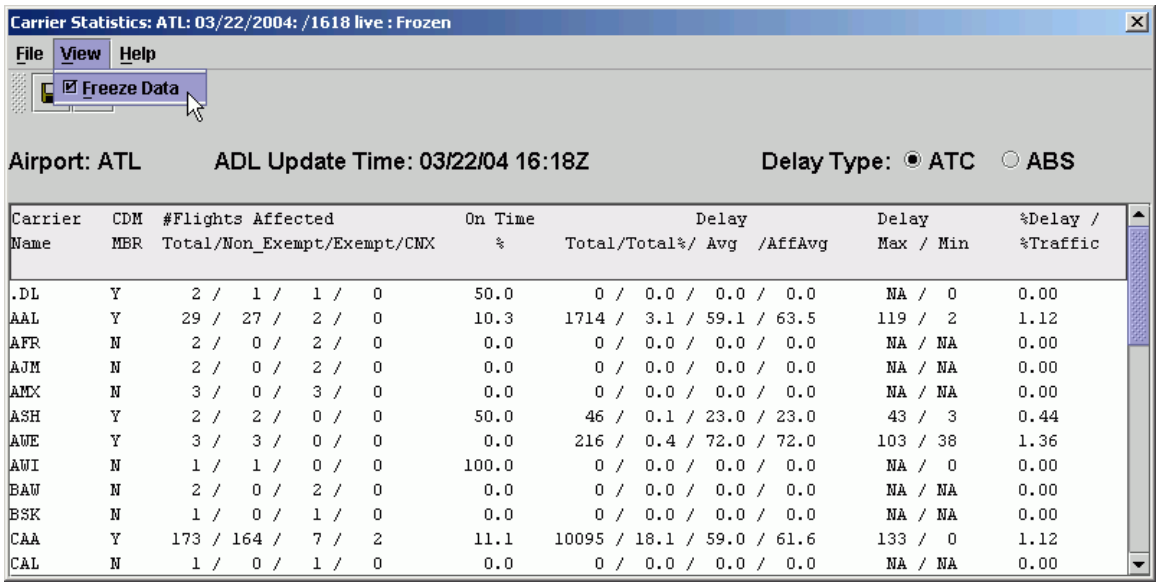
Figure 8-1: Time Line AAR vs. Demand counts

Deciding when a TMI is necessary is not always this simple, but the ATCSCC works closely with all participants through telcons to decide when a TMI is essential.

TMI Evaluation

Carrier Statistics Report

When a TMI is run, FSM generates a Carrier Statistics report. This report can be viewed from the *Control Panel* component by selecting **Reports** > *Carrier Statistics* or from **View** > *Carrier Statistics* on any TMI Coversheet. Make sure the desired airport is active to review the correct airport's carrier statistics. From the Carrier Statistics report you have the option to view ATC delay or ABS (total delay including airline delay). The Carrier Statistics report is based on flight's ETA and displays specific delay information for each carrier's flights. The Carrier Statistics report is particularly helpful to airlines. Airlines can view how the TMI is affecting them. Figure 8-2 is an example of the carrier statistic report being viewed by ATCSCC personnel. Airlines would only see their own call sign and any sub-carriers.



Carrier Name	CDM MBR	#Flights Affected Total/Non_Exempt/Exempt/CNX	On Time %	Delay Total/Total%/ Avg /AffAvg	Delay Max / Min	%Delay / %Traffic
.DL	Y	2 / 1 / 1 / 0	50.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00
AAL	Y	29 / 27 / 2 / 0	10.3	1714 / 3.1 / 59.1 / 63.5	119 / 2	1.12
AFR	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
AJM	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
AMX	N	3 / 0 / 3 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
ASH	Y	2 / 2 / 0 / 0	50.0	46 / 0.1 / 23.0 / 23.0	43 / 3	0.44
AWE	Y	3 / 3 / 0 / 0	0.0	216 / 0.4 / 72.0 / 72.0	103 / 38	1.36
AWI	N	1 / 1 / 0 / 0	100.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00
BAW	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
BSK	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
CAA	Y	173 / 164 / 7 / 2	11.1	10095 / 18.1 / 59.0 / 61.6	133 / 0	1.12
CAL	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00

Figure 8-2: Carrier Statistics

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The following information is displayed in the Carrier Statistics Report:

Carrier Name: The airline for which the delay data corresponds.

CDM MBR: Indicates if the carrier is a CDM member (Y/N).

 # Flights Affected – Total/Non_Exempt/Exempt/CNX:

- **Total:** Gives the total number of flights for the specified time period.
- **Non-Exempt:** How many of the total flights are Non-Exempt (included) in the program.
- **Exempt:** How many of the total flights are Exempt (receive no delay) from the program.
- **CNX:** How many of the total flights are canceled (CNX).

On Time %: Displays the percentage of flights which will arrive within 15 minutes of their ETA.

Delay - Total/Total%/Avg/AffAvg:

- **Total:** Shows the total minutes of delay for each airline.
- **Total %:** When the total delay minutes for an airline are divided by the total delay minutes for all airlines combined, the resulting value is the percentage of delay attributed to the airline.
- **Avg:** Displays the Average Delay minutes on a carrier's total number of flights.
- **Aff Avg**: Displays the Average Delay minutes for the carrier's flights affected by a program.

Delay - Max/Min:

- **Max:** Gives the values for the maximum delay amounts that a carrier's flights could receive.
- **Min:** Gives the values for the minimum delay amounts that a carrier's flights could receive.

% Delay / % Traffic: Indicates the delay equity for a carrier at an airport. A value of "1" in this column means that a carrier's delay is perfectly equitable. A value greater than "1" indicates a carrier will receive worse than average delay. A value less than "1" indicates that a carrier will receive less than average delay.

The bottom of the reports gives the same statistics for Scheduled/Non-Scheduled flights.

Carrier Statistics Menu Options

1. **File Menu:**

File > *Save as* - Saves the Carrier Statistics report as a .txt file in a directory that you specify.

File > *Print* - Prints the Carrier Statistics report viewed on your screen.

File > *Close* - Closes the Carrier Statistics report.

2. **View Menu:**

View > *Freeze Data* – When the Freeze Data checkbox is selected, the carrier statistics report will not dynamically update with every ADL. The Freeze Data checkbox is selected by default in FSM.

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3. **Help Menu:**

Help > *Carrier Statistics* - Accesses the web-based on-line help for Carrier Statistics.

Changing Airport Arrival Rates (AAR)

Changing the AAR on the *Bar Graph* is helpful to visually determine how a lowered AAR will affect the balance between capacity and demand. If demand exceeds the reduced AAR, then a TMI may be necessary.

Specify Model AAR

The **Bar Graph** > **Model Arrival Rates** > *Specify* allows you to change the Model AAR for a specific amount of time. You can set the Model AAR for up to 15 hours beyond the current time. The new Model AAR will be reflected in the *Bar Graphs*. The *Time Line* only displays actual ADL AAR rates.

Changing the Rate

There are several ways to change the model AAR using the *Specify Model AAR* window, including the ability to assign several different AARs within the same hour.

> **Note:** Although Fixes are displayed; you can only specify an AAR for an airport. Arrival Fix based programs will be a future enhancement.

To modify rates, enter the new value in the **With** text box, then fill in the hours in the **From Hr** and **Through Hr** text boxes to reflect the duration of the new AAR. Click **Fill** to automatically fill those hours. This is a good option when you need to fill a block of hours with one rate.

To fill several hours, each with different rates, you may enter new values directly into the Airport column cells next to the appropriate Time row cells that you wish to change.

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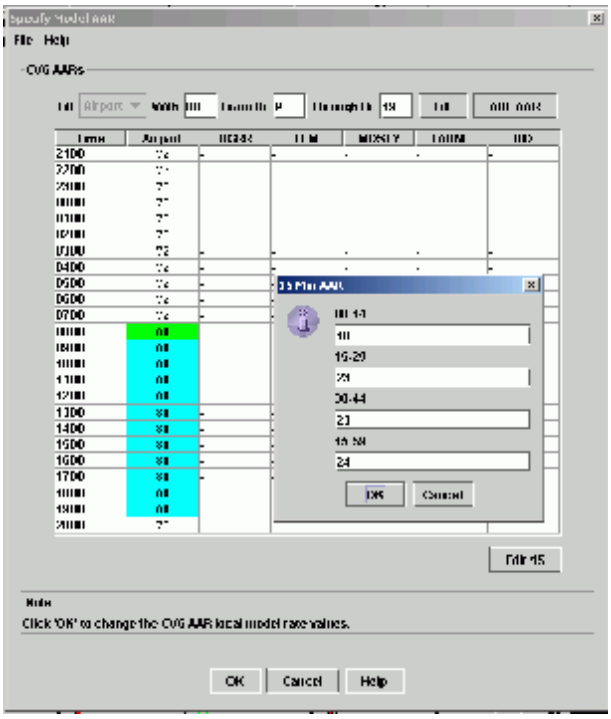

Figure 8-3: Specify Model AAR Window and 15 Min AAR Dialog Box

To fill a single hour with multiple AARs, click on the airport cell you wish to modify and then click the **Edit 15** button in the lower right-hand corner of the rates table or right-click on an active cell in the Airport column. This brings the *15 Min AAR* dialog box that allows you to assign AARs in 15-minute increments for that hour. For example, Figure 8-3 illustrates an AAR of 80, but for the first fifteen minutes the airport can only take 10 flights. Therefore, an AAR of 23 or 24 is assigned for the other 15-minute time increments. You can assign any value in each 15-minute increment as long as the total equals the overall AAR/ADR value for that hour. Click **OK** to change the 15-minute increments for that hour or **Cancel** to close the window. When an hour increment is not evenly distributed in the 15-minute increments, the cell will be colored green.

After changing your Model AAR information, click OK from the Specify Model AAR window to reflect the changes in your local *Bar Graph* component. Make sure the **View** > *Model AAR Line* checkbox is marked to view the modeled rates.

View Model AAR Line

The dashed, white line represents the modeled AAR. To view the model AAR line you must ensure the **View** > *Model AAR Line* checkbox is selected. In all FSM Modes, Model AAR will initially appear in the same position as the ADL AAR in the Demand Graph. If the ADL AAR is displayed on the graph, the dashed line (for modeling) will be hidden behind the white solid line. In addition to changing the model AAR rate from the **Bar Graph** > **Model Arrival Rates** > *Specify* feature, you can change the AAR by placing your cursor over the AAR line and dragging the model line to your desired model rate. Note that only the portion of the line to the right of the cursor will move. Any portion of the line to the left of your cursor should remain in the same position as you drag the line to a new AAR. The Bar Graph Component and the Specified Modeled AAR Rates

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component are dynamically synced; therefore when you alter an AAR rate from one component, the changes will also be reflected in the other. For more information on AAR Rate see *Chapter 7: View Airport Demand*.

Apply or Clear AAR Changes

After you have entered new AAR information, there are three options available on the Specify Model AAR panel:

OK - Applies the newly modeled AAR to the Bar Graphs and closes the *Specify Model AAR* window.

Cancel - Closes the *Specify Model AAR* window without taking any action.

Help - Defines the function of the component.

Specify Model AAR Menu Options

1. **File Menu**

File > *Open* – Opens previously saved AAR parameters.

File > *Save As* - Saves the AAR parameters to a text file which can be opened later and used again.

File > *Print* - Prints the Specify Model AAR window.

File > *Close* - Closes the Specify Model AAR window.

2. **Help Menu**

Help > *Demand Rates…* – Accesses the web-based on-line help for Specifying demand rates.

Changing Airport Departure Rates (ADR)

Changing the ADR on the Bar Graph is helpful to visually determine how a lowered ADR will affect the balance between capacity and demand on the monitored airport.

Specify Model ADR

The **Bar Graph** > **Model Departure Rates** > Specify allows you to change the Model ADR for a specific amount of time. You can set the Model ADR for up to 15 hours beyond the current time. The new Model ADR will be reflected in the Bar Graph component.

Changing the Rate

There are several ways to change the model ADR using the *Specify Model ADR* window, including the ability to assign several different ADRs within the same hour. See Figure 8-4.

To modify rates, enter the new value in the **With** text box, then fill in the hours in the **From Hr** and **Through Hr** text boxes to reflect the duration of the new ADR. Click **Fill** to automatically fill those hours with the new ADR. This is a good option when you need to fill a block of hours with one rate.

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To fill several hours, each with different rates, you may enter new values directly into the Airport column cells. Click **OK** to change the ADR rates, **Cancel** to close the window or **Help,** which defines the function of the component. To reset airport values click the **ADL ADR** button.

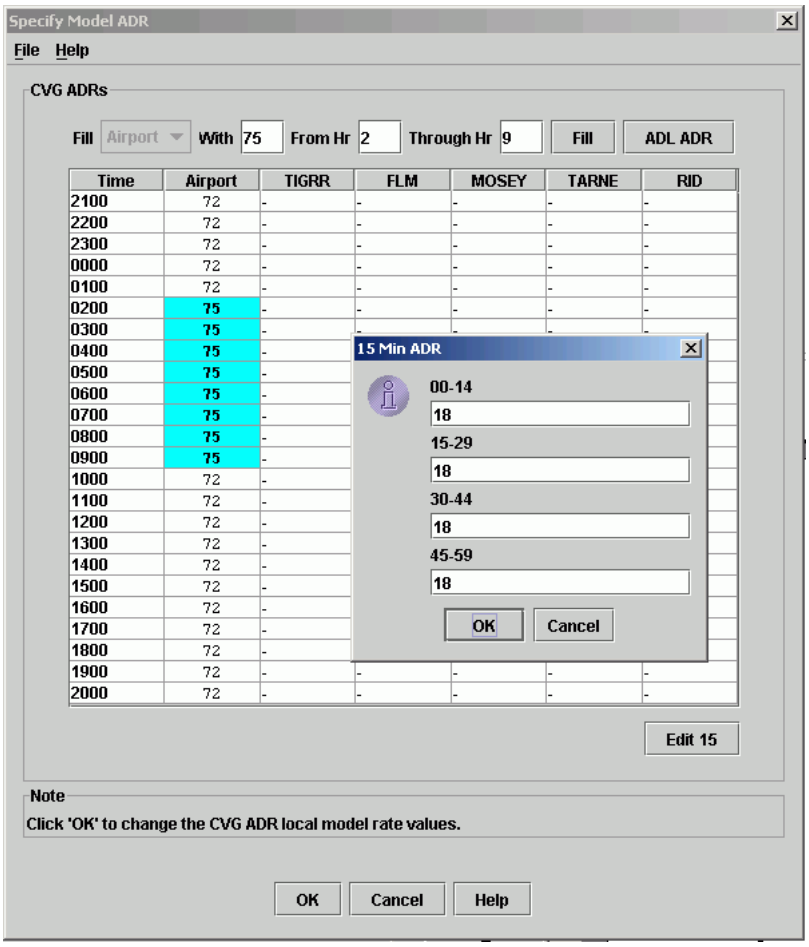

Figure 8-4: Specify Model ADR Window and 15 Min ADR Dialog Box

To fill a single hour with multiple ADRs, click the cell you wish to modify and then click the Edit 15 button at the lower right-hand corner of the rates table or right-click on the active cell in the Airport column. This brings up the *15-minute ADR* window that allows you to assign the ADR in 15-minute increments for that hour. For example, Figure 8-4 illustrates an ADR of 75, but for the first fifteen minutes the airport can only take 10 flights. Therefore, an ADR of 21 or 23 is assigned for the other 15-minute time increments. You can assign any value in each 15-minute increment as long as the total equals the overall ADR value for that hour. Click OK to change the hour or Cancel to close the window. When an hour increment is not evenly distributed in the 15-minute increments, the cell will be colored green.

After changing your Model ADR information, click **OK** from the *Specify Model ADR* main window to reflect the changes in your local *Bar Graph* component. Make sure the **View** > *Model ADR Line* checkbox is marked to view the modeled rates.

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View Model ADR Line

The dashed, cyan line represents the modeled ADR. To view the model ADR line the user must ensure the **View >** *Model ADR Line* checkbox is selected. In the all FSM modes, the model ADR will initially appear in the same position as the ADL ADR in the Demand Graph. If the ADL ADR is displayed on the graph, the dashed line (for modeling) will be hidden behind the solid cyan line. In addition to changing the model ADR rate from the **Bar Graph > Model Arrival Rates** > *Specify* feature; you can change the AAR by placing your cursor over the AAR line and dragging the model line to your desired model rate. Note that only the portion of the line to the right of the cursor will move. Any portion of the line to the left of your cursor should remain in the same position as you drag the line to a new ADR. The Bar Graph Component and the *Specified Modeled AAR* component are dynamically synced; therefore when you alter an AAR rate from one component, the changes will also be reflected in the other. For more information on ADR rates see Chapter 7: View Airport Demand.

Apply or Clear ADR Changes

After you have entered new ADR information, there are three buttons available on the Specify Model ADR panel:

OK - Applies the newly modeled ADR to the Bar Graph and closes the *Specify Model ADR* window.

Cancel - Closes the *Specify Model ADR* window without taking any action.

Help - Defines the function of the component.

Specify Model ADR Menu Options

1. **File Menu**

File > *Open* - Opens previously saved ADR parameters.

File > *Save* - Saves the ADR parameters to a text file, which can be opened later and used again.

File > *Print* - Prints the Specify Model ADR window.

File > *Close* - Closes the Specify Model ADR window.

2. **Help Menu**

Help > *Demand Rates…* – Accesses the web-based on-line help for the Demand Rates Window.

Reset AAR/ADR Model Rates

There are several methods to reset the AAR/ADR data that you can change (during your FSM session) to reflect the original data. In the *Bar Graph* you can select **Bar Graph** > **Model Arrival Rates** > *Reset* in the Monitored Live, Historical or GDT mode or select

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Utilities > **Model Arrival Rates** > *Reset* in the *Control Panel*. You can also reset the AAR Rates from the *Specify AAR Rates* window. Select **Bar Graph** > > **Model Arrival Rates** > *Specify* and press the **ADL AAR** button to reset the AAR rates to the original values. The steps to reset ADR Rates are identical to those for the AAR rates with the exception of the GDT mode. Remember, the ADR rates are not available in GDT Mode.

Manipulating Data Time

Set Time (Historical Mode)

When working in Historical Mode, you have the ability to specify the time you would like to view. The data time can be specified from the *Open Data Set* component when you initially open an airport in historical mode (See Chapter 3: Open Data Set for more information) or the time can be changed once you are already in historical mode for an airport. To change the data time when viewing an airport in historical mode, select **Bar *Graph*** > *Set Time (Historical Mode Only).* This feature is only available in Historical Mode. The Set time dialog box will appear and allows you to specify the time at which to view airport data (see Figure 8-5). Select the day from the drop-down box and time in "hhmm" format.

> **Note**: Time in FSM is always defined as Zulu time unless otherwise specified.

Click **OK** to update flights' data to the closest, but no later than, the entered time. Click **Cancel** to close the Set Time dialog box without changing the data time.

Figure 8-5: Set Time Dialog Box

Modify Data Time (GDT Mode only)

From the General Tab on the GDT *Setup* component is the *Data Time* parameter. The Data time allows you to change the data time without making any modifications to the data itself. This is a useful analysis tool. In the Data Time textbox, enter a time in "hhmm" format to change the time. Valid times are from 0- 2359. When you have changed the Data Time to a value other than the current time, the Data Time text field box will be highlighted in red as well as the GDT Tab border.

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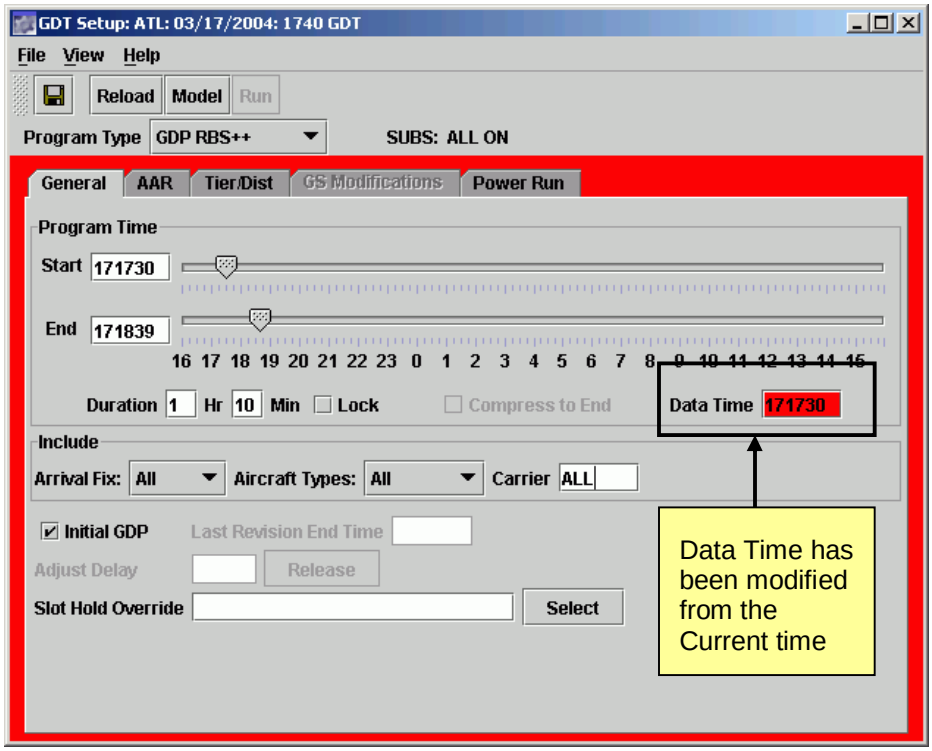

Figure 8-6: GDT Setup Component

Update Data Time (Historical Mode Only)

The **Update** button on the *Control Panel* component is only used when in Historical mode. Press **Update** to receive the next historical ADL updates. If you select Update within any other mode except the historical mode, an error message will indicate: "Not a historical data set".

Remove and Restore Flights (CSA Only)

Remove Flights

You can remove flights from the ETMS database using FSM. This feature is useful to remove an airline that goes on strike, eliminate duplicate flights, or remove erroneous flights listed in the OAG. To remove a flight, make sure the airport you wish to remove the flight from is in focus, and then select **ETMS Tools** > **EDCT Commands** > *EDCT Remove* from the Main Control Panel (see Figure 8-7). The EDCT Remove dialog box will prompt you to type in the flight number and date. To remove the flights from the database, press **Send.** FSM will prompt you to decide whether you really want to remove the flight. Click **YES** to remove the flight. Click **NO** to cancel the action. Press **Cancel** to close the dialog box without taking any action. **Help** defines and explains the Remove Flights feature.

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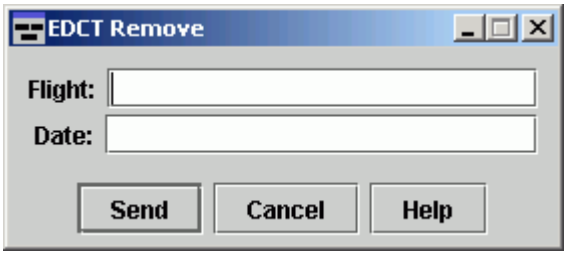

Figure 8-7: EDCT Remove Dialog Box

Restore Flights

To restore a flight, select **ETMS Tools** > **EDCT Commands** > *EDCT Restore* from the *Control Panel,* as shown in Figure 8-8. The EDCT Restore dialog box will prompt you to type in the flight number and date. To restore the flight to the database, press **Send.** FSM will prompt you to decide whether you really want to restore the flight. Click **YES** to restore the flight. Click **NO** to cancel the action. Press **Cancel** to close the dialog box without taking any action. **Help** defines and explains the Restore Flights feature.

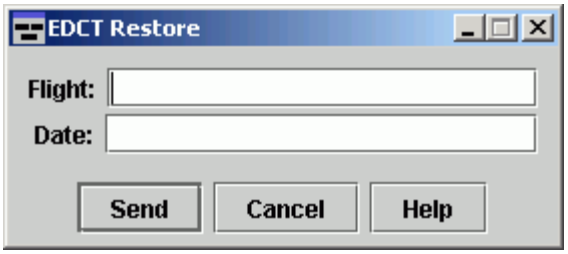

Figure 8-8: EDCT Restore Dialog Box

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9 Modeling a Traffic Management Initiative

Due to unexpected events, such as bad weather at an airport, the FAA will delay flights scheduled to arrive at the affected airport. Flights are examined to determine whether they will be included in a Traffic Management Initiative (TMI) based on the time period of the operation. Those flights eligible for inclusion in the operation will be checked against the various exemption criteria specified.

Generally a TMI is necessary where arrival demand excessively surpasses the airport capacity. The airport capacity is defined by the AAR. AAR rates can be raised or lowered due to weather, runway closures, or any other significant event. FSM helps determine what type of Program Type would be necessary to adequately control the traffic flow into the airport.

One important function of FSM GDT Mode is that it will allow you to view "what-if" scenarios. That is, FSM will analyze the effects of a TMI operation using different parameters you set. FSM's analysis capabilities will help determine the best parameters for a TMI operation: one that minimizes impact on air carrier operations ***and*** maximizes efficiency during adverse conditions. This chapter discusses modeling any TMI in GDT Mode.

Modeling a TMI

The GDT Setup Panel component is used to model, issue and send TMIs. The TMI parameters are managed from the GDT Setup Panel. When you model a TMI, you must first specify the type of TMI you wish to model from the **Program Type** selection box located on GDT Setup component. A brief description of each Program Type is defined below:

GDP RBS++ - The default Program Type. This program runs the Ration By Schedule Algorithm plus Compression.

GDP RBS – The original Ration By Schedule Algorithm. RBS is based on IGTA wheel arrival time (IGTA – Taxi).

Compression – The program is run to decrease delay on flights already involved in an existing GDP. If there are a number of slots for canceled flights in the stack hours, compression can be used to move these flights to a later slot without needing to extend the GDP.

GS Immediate - Unlike ground delay programs, which delay flights because of a reduced AAR, the Ground Stop function prevents flights from departing until further notice. GS Immediate issues the Ground Stop Immediately.

GS Future - Similar to GS Immediate, this Ground Stop is issued for a specific time in the future.

Blanket – This Program type can be used to revise any ground delay operation. This option is used to add or subtract a fixed number of minutes to or from FAA-imposed delay. Blanket is not to be used in conjunction with GS.

Airborne Holding - Traffic management specialists use this to determine whether or not to issue a GDP. In certain situations, putting delay on flights en route may be the better

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option rather than delaying flights on the ground. The airborne holding algorithm in FSM produces the amount of expected airborne holding delay, defined as ASLOT - ETA, which would result from running a program.

Purge - Cancels the GDP or GS, releasing all delay on included flights. This Program type requires no input on any Tab option.

GDT Setup Panel File Menu

Figure 9-1: GDT Setup Menu Bar

The menu bar (shown above in Figure 9-1) in the GDT *Setup* component contains three options**: File, View**, and **Help**.

1. **File Menu:**

File > *Load Proposed Parameters* – Opens a secondary drop-down menu to select from specific parameter options:

> *Ground Delay Program* – Loads the proposed GDP parameters.

> *Ground Stop* - Loads the proposed Ground Stop parameters.

> *Blanket* - Loads the proposed Blanket parameters.

> *Compression* - Loads the proposed Compression parameters.

File > *Load Actual Parameters* - Opens a secondary drop-down menu to select from specific parameter options:

> *Ground Delay Program* - Loads the actual GDP parameters.

> *Ground Stop* - Loads the actual Ground Stop parameters.

> *Blanket* - Loads the actual Blanket parameters.

> *Compression* - Loads the actual Compression parameters.

File > *Open Coversheet* – Opens the Coversheet file exploder that contains all the Coversheet files. Select the Coversheet you wish to open and press **Open**. Coversheet files are all named covr.xxx, where xxx is the airport three-letter identifier. The Date and ADL time followed by what kind of Coversheet (GS, GDP, or CNX) is also included in the file names.

File > *Open Parameters File* – Opens the PARAM_DIRECTORY File in file explorer. Select the parameters file and press **Open** to view the Parameters Files.

File > *Save as* - Saves the *Setup* component as a .jpg image to a directory of your choice.

File > *Close* - Shuts down the *Setup* component and all the complimentary GDT components for that particular airport.

2. **View Menu**:

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View > *Rename Window…*- Displays the Rename Window dialog box and allows you to change the component name in the title bar (See Figure 9-2). Enter your desired component name then click **OK** to change the title bar heading. Click **Cancel** to close the Rename Window dialog box without making any changes.

Figure 9-2: Rename Widow Dialog Box

There are six additional display options to choose from the **View** menu. If you close a component and wish to reopen it, use the **View** menu options to select and reopen the desired component.

View > *Data Graph* - Displays the Data Graph Component

View > *GDT Map* – Displays the *GDT Map*

View > *Bar Graph* – Displays the GDT *Bar Graph*

View > *Time Line* **–** Displays the GDT *Time Line*

View > *Data Table* **–** Displays information in table format that is found in the Data Graph

View > *Flight List* – Displays the Flight List for the monitored airport. The default Flight List will include AC, ID, ETD, ETA, DEST, ORIG, and ARTA-CTA data elements.

3. **Help Menu:**

Help > *GDT Setup* - Accesses the web-based on-line help for the *GDT Setup* component. FSM on-line help can be accessed at any point by pressing the F1 key on your keyboard.

Selecting the Parameters

To implement a TMI, you need to set the parameters to be used for the TMI. This is done in GDT Tools mode. You can open any monitored airport in Ground Delay Tools (GDT) mode. First select an airport currently being monitored and then select the **GDT Setup** button from the main *Control Panel* component. If there is no airport in focus when you press the **GDT Setup** button, an FSM error message will indicate that "No current data set" is selected.

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Figure 9-3: FSM Control Panel

Clicking the **GDT Setup** button will open four GDT components: *GDT Setup*, *Data Graph*, *GDT Map*, and *Bar Graph* components, as shown in Figure 9-4 . All GDT components interact with one another; The *GDT Setup* and *GDT Map* dynamically reflect one another, where as pressing **Reload** or **Model** buttons on the *GDT Setup* panel will reflect and display changes in all components. The **Program Type** field in the *GDT Setup* component allows you to select the type of TMI operation to run.

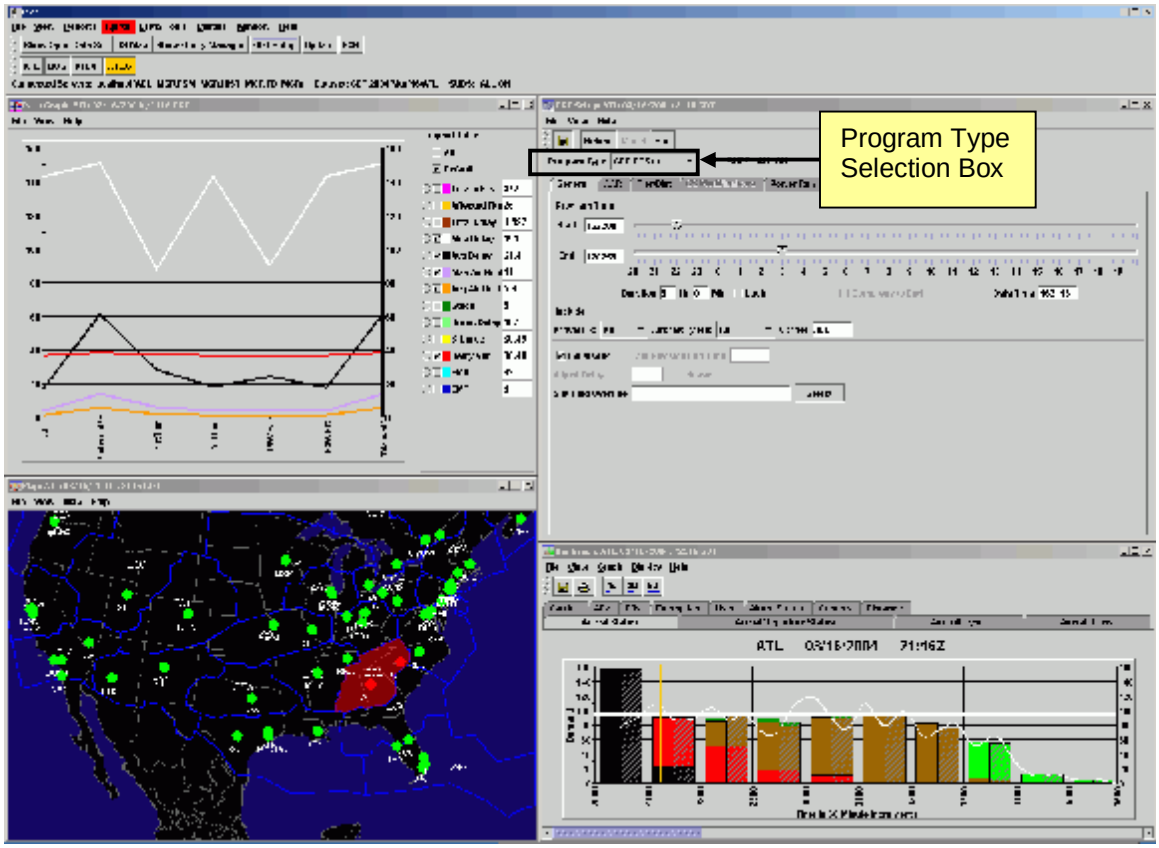

Figure 9-4: Initial Default GDT Display

GDT Setup Panel

The *GDT Setup* tab options will change based on your **Program Type** selection, and only available features in each tab will be active. See Chapter 4 for more detailed information on GDT components.

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GDT Setup Panel: General Tab

The **General** Tab is active for all Program Types and is the default Tab opened when the *GDT Setup* component is initially opened. The **General** Tab allows you to enter the Program Time, Include Arrival Fix and Aircraft Types, Select Initial GDP or Revision Time, Adjust Delay, and select Slot Hold Override.

Program Time: The Duration of the program is set by typing in the time in the corresponding textboxes using the format [ddhhmm] or by clicking and dragging the pointers on the Start Time and End Time for the desired hours. You can also determine the end time of the program by entering the duration of the program. The duration is broken up into the [hr] text box and [min] text box. Filling in the duration will change the end time accordingly. For this example, shown in Figure 9-5, the duration is set to 5 hours.

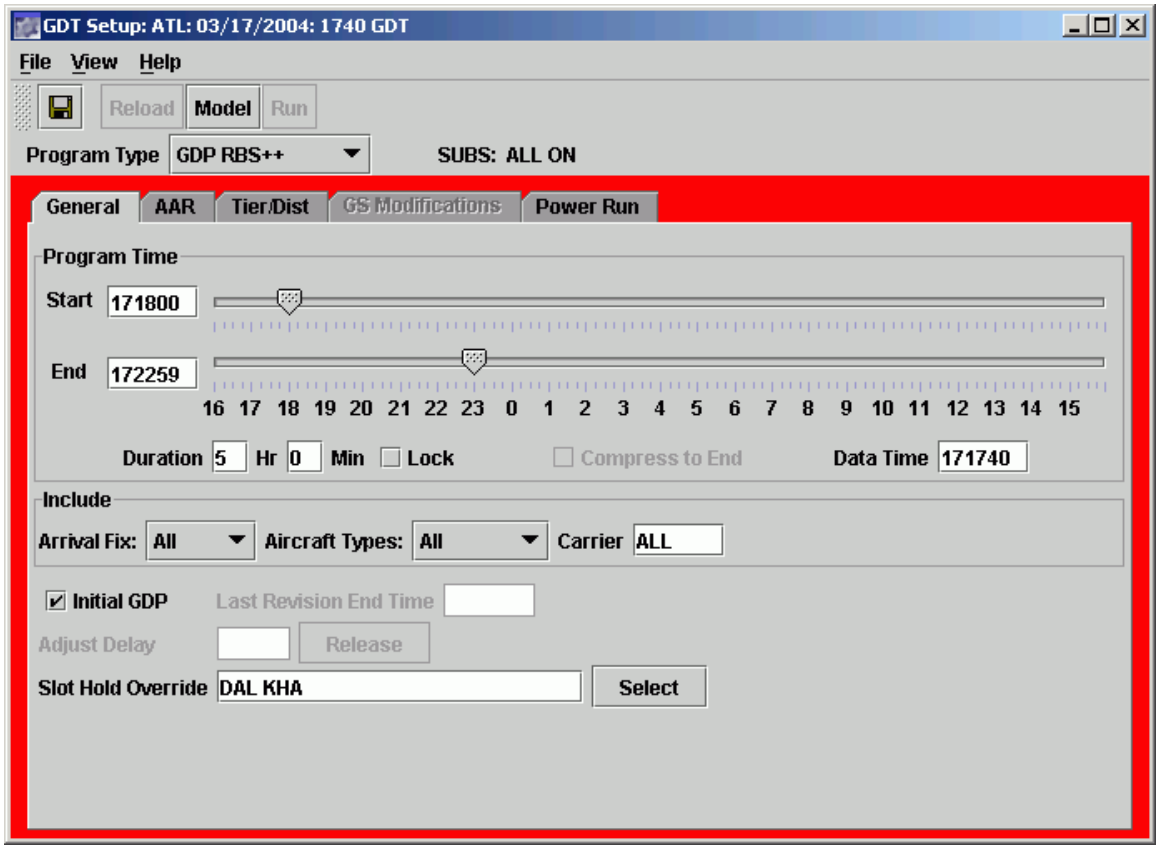

Figure 9-5: GDT Setup General Tab

When the **Lock** checkbox option is selected it locks the duration of the program. Changing either the start time or the end time will change both times according to the TMI duration time.

Compress to End checkbox is only available when the Program Type Compression is selected. Checking this box will compress all flights that have a control time.

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Data Time is defaulted to the current ADL time (ddhhmm). Change the Data Time only if you would like to model your TMI on a time other than the current time. If you change the Data Time to differ from the current time, the box will highlight in red.

Include: This section of the General Panel requires no user input unless you wish to specify a particular arrival fix, aircraft type, or a single carrier in your program parameters. Otherwise, the defaults are set to ALL.

> **Note:** Specifying individual arrival fixes is not an available feature in version 7.8. This will be a future enhancement.

Initial GDP and **Last Revision End Time** option is only available for GDP RBS++ and RBS only. If this is an initial program (there is not program currently in place for that airport) the **Initial GDP** checkbox should be selected. If you are running a revision, the **Last Revision End Time** will be filled out with the End Time of the last Coversheet. Ensure that the Initial GDP checkbox is unchecked. It is important that **Initial GDP** is not selected during a revision.

Adjust Delay: This parameter is only available when using the Blanket Program Type. Enter the amount of decreased delay in minutes (negative number) or the amount of additional delay in minutes (positive number) in the Adjust Delay text field. Clicking the **Release** button will fill in the Adjust Delay text field with *–999*, which is equivalent to releasing all delay from your specified criteria.

Slot Hold Override: The Slot Hold Override field allows you to override an airline's slot holding status by typing an airline name directly in the textbox or by clicking on the **Select** button to display and choose one or more of the airlines that are currently holding slots at that airport, as shown in Figure 9-6 (you can only edit Slot Hold Override parameters for RBS++, RBS, and Compression).

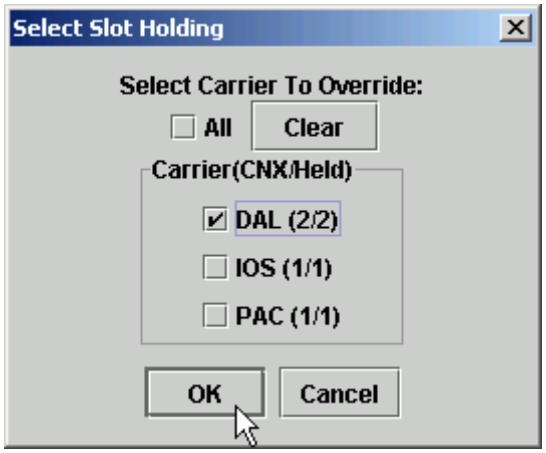

Figure 9-6: Slot Hold Override Selection Box

GDT Setup AAR Tab

The **AAR** Tab is active for all Program Types except Compression and Blanket. Click on the **AAR** Tab to enter the reduced AAR for that airport for GDPs, Ground Stops, and Compression Program Types. See Figure 9-7.

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Note: Changing AARs for fixes is not a functional option. The Fill drop-down will only have Airport as a valid entry. Assigned AARs for certain fixes will be a future enhancement.

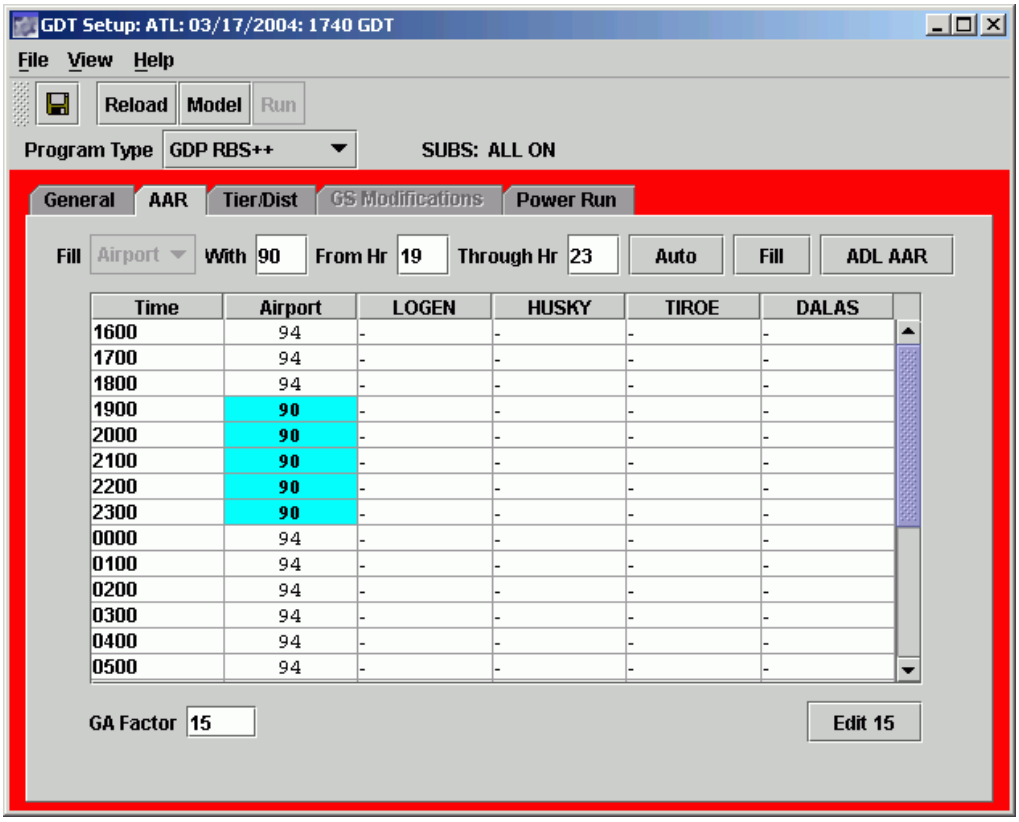

Figure 9-7: GDT Setup Panel AAR Tab

A few steps are used to quickly change the rate. Enter the new AAR rate into the **With** textbox then enter the hour at which you would like the new AAR to take affect in the **From Hr** field. Likewise, enter the last hour in which you wish to use the new AAR in the **Through Hr** field or click **Auto** to automatically fill the [From Hr] and [Through Hr] textboxes with the Start and End times that were specified in the General tab. Click **Fill** to automatically fill those hours with the new AAR. You may also type new AAR values directly in the hours that are being changed.

In the example above, a rate of 68 was filled in for the hours of 2000z – 0100z. The rate for individual hours may be adjusted in 15-minute increments by selecting the appropriate textbox for the hour and then clicking the **Edit 15** button or by right-clicking the textbox you wish to edit. Click **ADL AAR** to fill in the actual AAR from the ADL.

Setting a GA factor provides room for suspected pop-up flights that show up in a given hour during the TMI. For example, if an airport's AAR is set to 68 and there is a GA factor of 3, then FSM will model the program based on an AAR of 65, effectively leaving some cushion for the suspected pop-up flights.

Note: GA Factor parameter is not available for Ground Stop initiatives.

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GDT Setup Tier/Dist Tab

The **Tier/Dist** Tab is used to identify the scope of a GDP, GS, or Blanket Program types. The **Tier/Dist** Tab has two general displays, one is Tier based and the other is Distance based. From the **Exempt By** dropdown box, select either a Tier or Distance based initiative.

Identify the Facilities Delayed – Tier Based

To model a tier-based TMI select the **Exempt by** *Tier* option in the **Tier/Dist** Tab shown in Figure 9-8. The Tier panel contains three sections where parameters can be modified: Centers, Airports, and Flights.

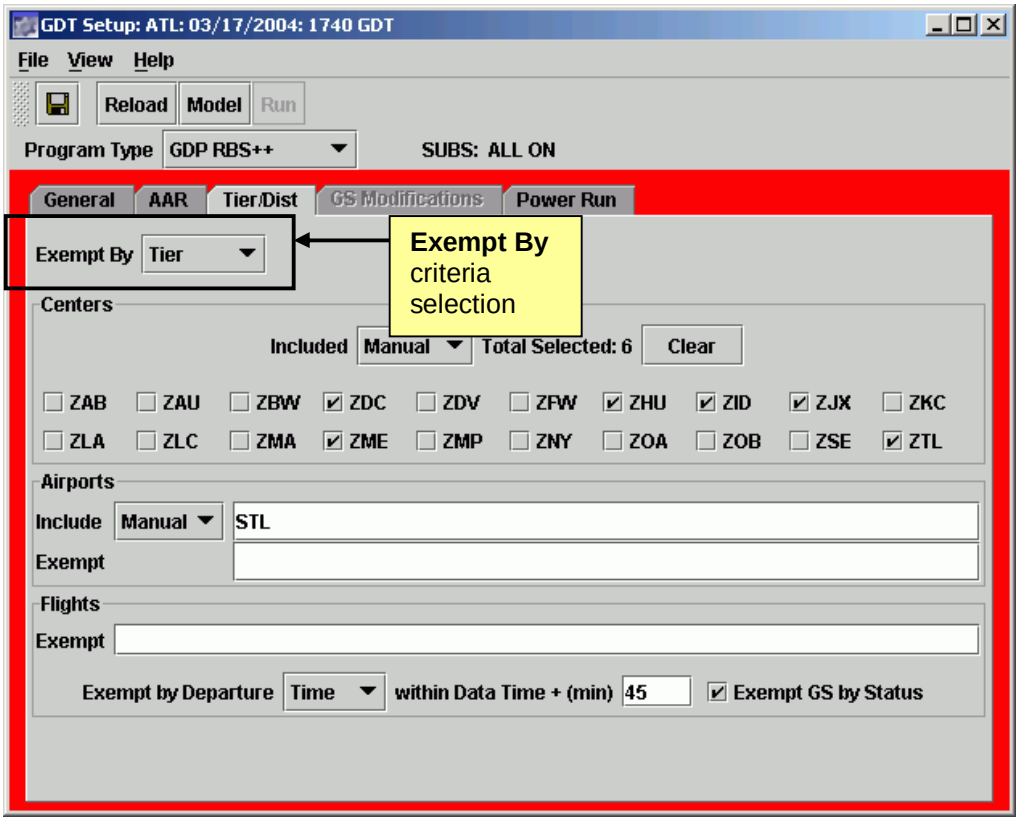

Figure 9-8: Exempt By Tier selected

The **Exempt By** *Tier* selection is used to identify the facilities to be included in a TMI. To identify the Centers who will receive delay, select the appropriate center group keyword from the **Included** drop down list. After selecting the primary facilities to include in the TMI you can select/unselect individual centers manually.

In the Airports Section, list any airports' three-letter ID that you wish to include in the program that are outside of the center scope you have selected above in the Airports **Include** text field. To exempt an airport that falls within the center scope, list the airport in the Airports **Exempt** text field.

List any priority flights (diversion recovery or lifeguard) that should be exempt from delay with the flight's ACID in the Flights **Exempt** text field. Check that **Exempt**

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Flights by Departure > *Time* is selected. *Time* is always used *except* when transitioning from a Ground Stop to a GDP event. When Exempt by Time is selected, enter a value in the **within Data Time + (min)** text field. The value should equal the number of minutes relative to the data time to exempt flights that depart within that time. The recommended and default value is 45 minutes.

The *GDT Map* component can also be used to include or exempt centers and airports from the program. The color red indicates which centers and airports are included in the TMI. Green airports are exempt from delay. Centers (ARTCC'S) are outlined in blue and have no color when exempt. Clicking on an airport or center will change its status accordingly. Figure 9-9 is an example of a 2nd tier program for ATL airport with center ZFW exempt, airport BNA exempt, and DEN airport non-exempt. See Chapter 4: *GDT Map* for more information on how to include/exclude centers and airports using the GDT Map.

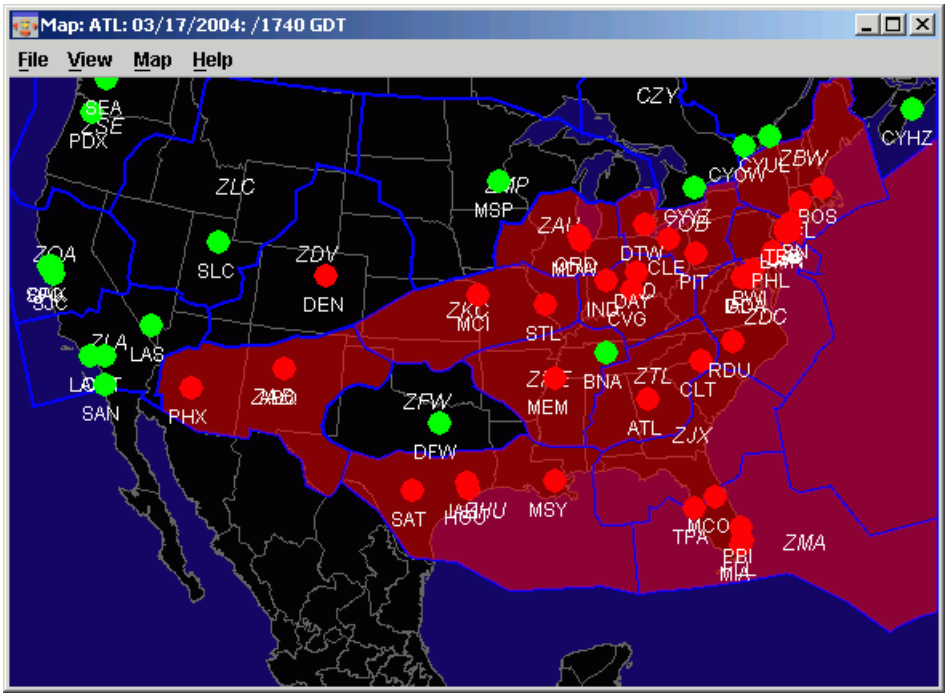

Figure 9-9: 2nd Tier program with center ZFW and airport BNA exempt and DEN non-exempt

Any changes made to the *GDT Map* will dynamically reflect in the *GDT Setup* component's Tier/Dist Tab. Figure 9-10 is the Tier *Setup* component that reflects the Map in Figure 9-9.

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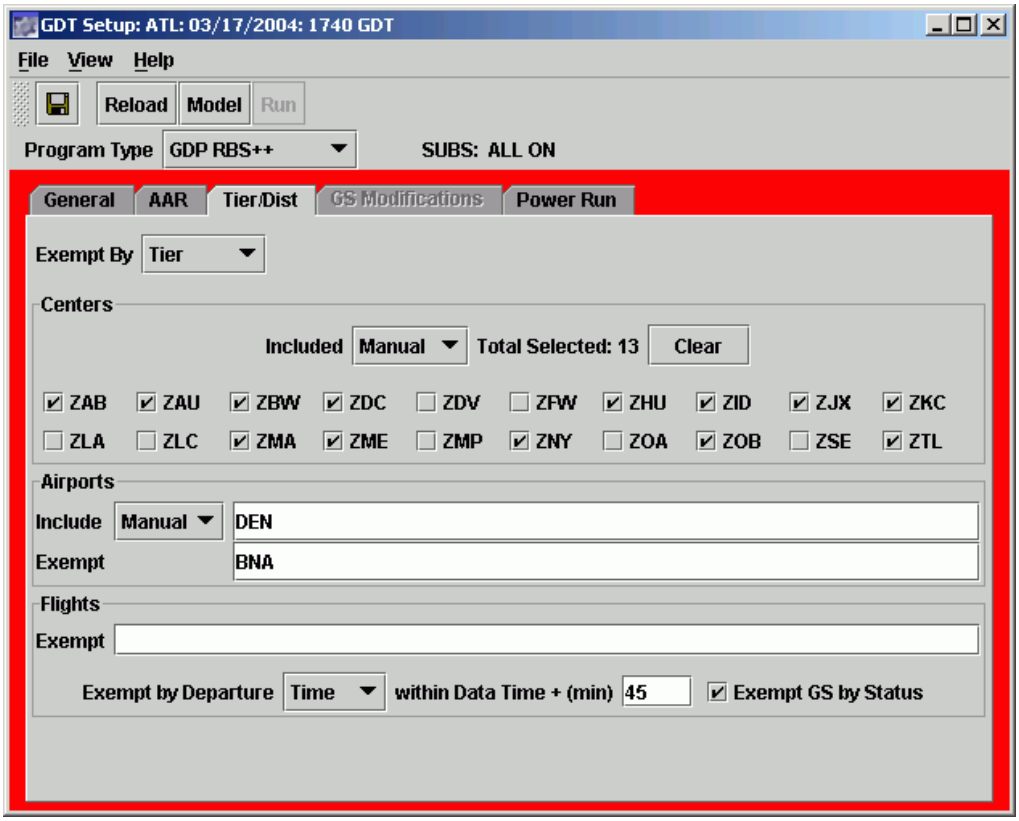

Figure 9-10: Tier/Dist Tab

Identify the Facilities Delayed – Distance Based

To model a distance-based TMI select the **Exempt by** *Distance* option in the **Tier/Dist** Tab, as shown in Figure 9-11. The Distance panel contains four sections where parameters can be modified: Distance, Centers, Airports, and Flights.

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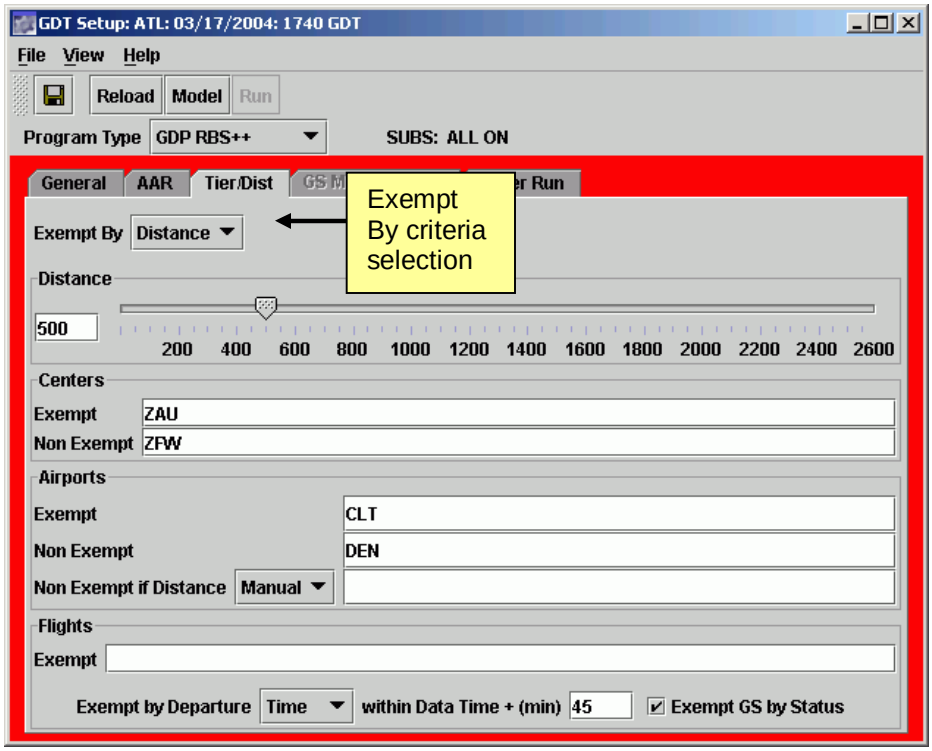

Figure 9-11: Distance Panel

The **Exempt By** *Distance* selection is used to identify the facilities involved in a TMI based on distance. The default distance is set to 200 nautical miles when the distance tab is initially opened. To change the distance, enter your desired distance in the **Distance** textbox or click and drag the sliding bar. To exempt Centers from delay that are within the distance range, enter the center in the **Exempt** text field. To give delay to centers that are outside the scope of the distance, manually enter the center in the **Non Exempt** text field.

Under the Airports Section, in the **Exempt** text field, list any airports' three-letter ID that you wish to exempt from delay. In addition, you can give delay to an airport that is outside the distance range by entering the specific airport(s) in the **Non Exempt** text field. To include Canadian airports (give EDCTs to) if they fall within the set distance range, enter the Canadian airport in the **Non Exempt if Distance** text field.

List any priority flights (diversion recovery or lifeguard) that should be exempt from delay with the flight's ACID in the Flights **Exempt** text field. Make sure in the "Flights" section that the **Exempt by Departure** > *Time* is selected. *Time* is always used except when transitioning to a GDP from a Ground Stop event. When Exempt by Time is selected, enter a value in the **within Data Time + (min)** text field. The value should equal the number of minutes relative to the data time that will capture and exempt flights departing within that time. The recommended and default value is 45 minutes.

The GDT Map can also be used to adjust the distance radius and add exempt/non exempt centers and airports to the program. The color red indicates which airports are included (that will receive delay) in the Initiative. Airports highlighted in green are exempt from

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delay. Centers are outlined in blue and have no color when exempt. To adjust the distance radius, place your cursor over the edge of the circle and drag and drop the circle to adjust the distance. Clicking on an airport or center will change its status accordingly. Figure 9-12 is an example of a distance-based program at 400 nautical miles for ATL airport with ZME center Non- Exempt, CLT airport exempt, and DTW airport Non-Exempt. The *GDT Setup* component in Figure 9-11 reflects the same program. The *GDT Map* and *GDT Setup* dynamically interact. See Chapter 4: GDT Map for more information on how to exempt/non-exempt centers and airports using the GDT Map.

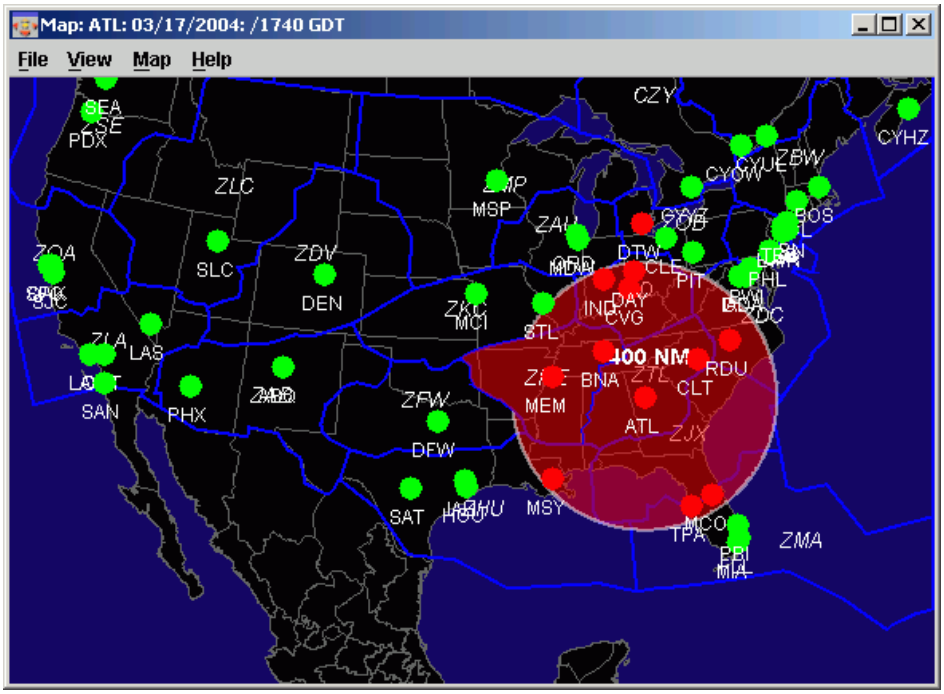

Figure 9-12: GDT Map - Distance Program

GS Modification Tab

The **GS Modifications** Tab is only available for GS Immediate and GS Future Program Types. This Tab is used to input additional information/parameters for Ground Stops.

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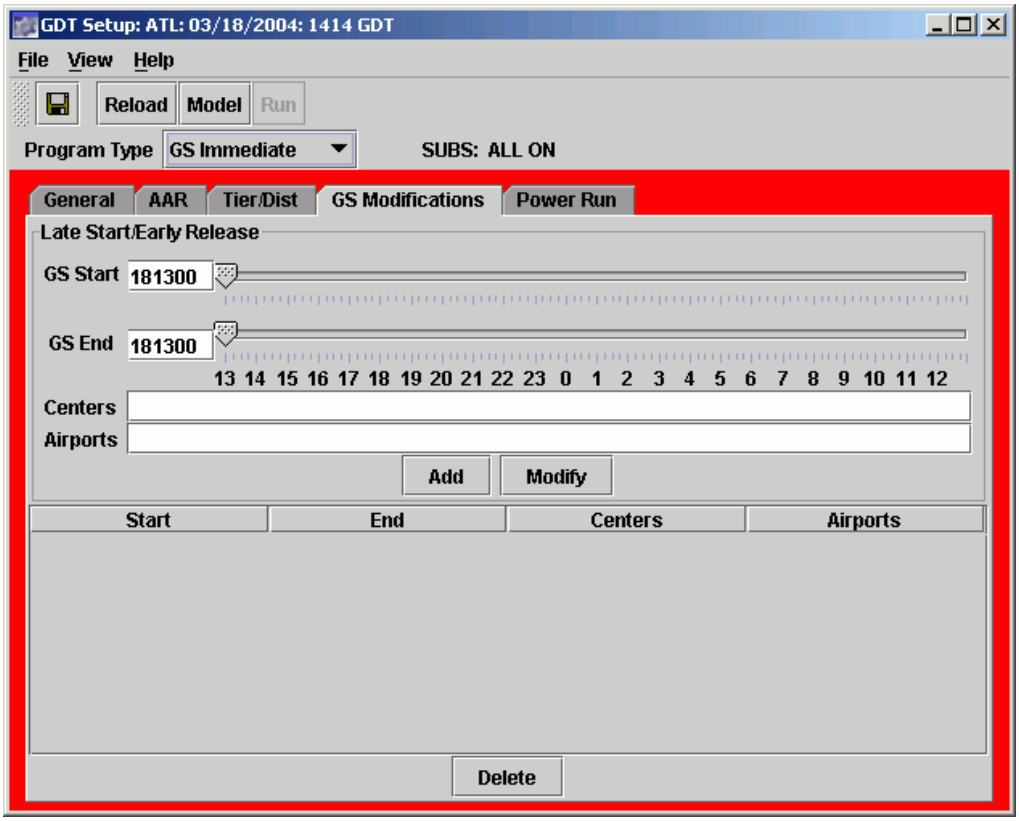

Figure 9-13: GS Modifications Tab

You can fine-tune your Ground Stop by specifying particular Centers and/or Airports to have start times or end times that differ from the main Ground Stop time parameters. All other parameters in ground stop programs remain the same. The statements you add to this field can be edited or deleted. To edit, select the center or airport then press **Modify**. To delete, select the center/airport and then press **Delete** at the bottom of the **GS Modifications** Tab.

Power Run Tab

The **Power Run** tab is only available for GDP RBS++, GDP RBS, GS Immediate and GS Future Program Types. To view a scenario, select the type of Power Run to model in the Power Run By drop-down menu and press **Model**. See Chapter 4: Power Run Options for descriptions of the Power Run options. **Model** will display the effects of potential operation parameters and how traffic at the airport would be affected by using these parameters for an actual program in all GDT components. The Data Graph and Data Table statistics will reflect the Power Run option you selected from the Power Run Tab and are useful tools to help evaluate your initiative.

Modeling Analysis

Preview Your Work

After pressing **Model** from the *GDT Setup* component, all FSM GDT components will change to reflect the modeled TMI. Viewing these components can help you decide if

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the TMI you have modeled is the best scenario for the traffic flow problems at an airport. All of the following components are based on an ATL modeled RBS++ GDP program..

GDT Time Line Component

To open the GDT *Time Line*, select the **View** > *Time Line* option from the *GDT Setup* component. You can preview the changes made in the *Time Line* as a result of running the TMI model. A quick glance at the *Time Line* shows you the number of canceled flights (squares) and the number of delayed flights (triangles).

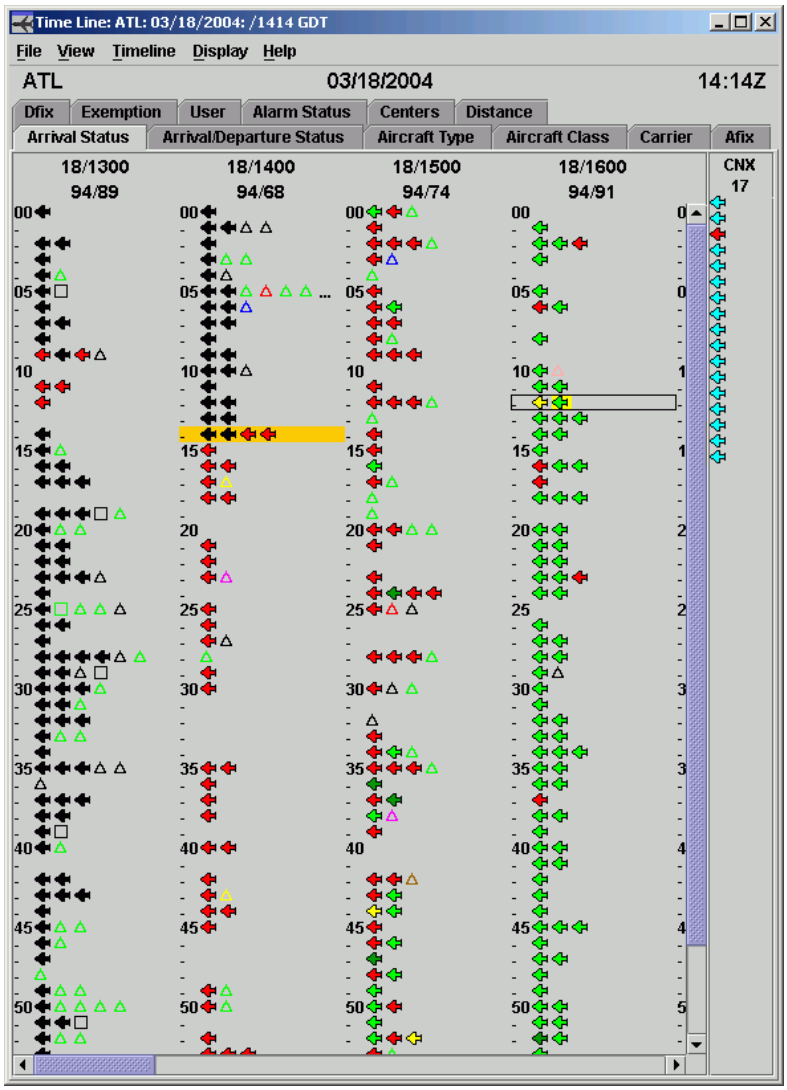

Figure 9-14: Modeled ATL GDP: Time Line View

GDT Bar Graph Component

The graph always displays both solid and hashed bars. Solid bars represent the original data, while bars that represent modeled data will be hashed. Make sure that the **View** > *Model AAR Line* checkbox is selected from the GDT *Bar Graph* menu to view the modeled AAR (dashed white line). The bar graph can indicate if the stack at the end of

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the program is going to be a potential problem and allows you to view the overall impact of the program. (See **Figure 9-15**

Figure 9-15: Modeled ATL GDP: Bar Graph View

GDT Data Graph Component

The GDT *Data Graph* provides a visual statistical representation of the modeled TMI. The Power Run option that was run is displayed on the X-axis. Using your mouse, drag the black vertical line to the desired Power Run option or just click the mouse over the desired option to move the line. The delay statistics to the right of the *Data Graph* reflect the line of delineation of the scenario. Additionally, changing the Power Run option will automatically update all GDT components to reflect the new parameters. Rolling your mouse over any line in the Data Graph will give you the delay statistic count for the colored line that reflects the results of the option.

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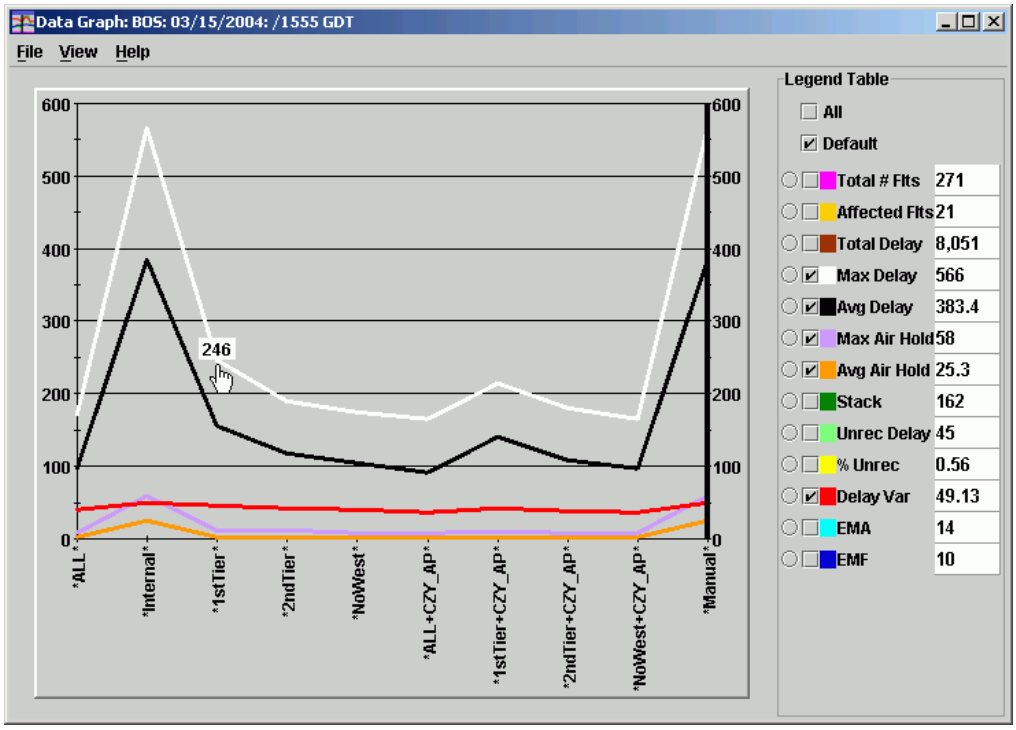

Figure 9-16: Modeled ATL GDP: Data Graph View

Viewing Data in the Data Graph

The delay statistics are displayed in the Legend Table. The legend table is displayed by default when the Data Graph is opened. Hide the legend by *un-checking* the **View** > *Show Legend* box from the Data Graph Menu. In the Legend Table, you can view a desired delay statistic in several ways. Checking the **All** checkbox will select and display all the delay statistics. Checking the **Default** checkbox will display the default delay statistics, which are Max Delay, Avg Delay, Max Air Hold, Avg Air Hold, and Delay Var. You can manually select/deselect any of the delay statistic checkboxes to be viewed in the Data Graph. To view one delay statistic in more detail, select the desired option radio button located to the left of the checkboxes. The radio button option will display only one delay statistic at a time, but will give you a more refined looked at the numbers. Delay Statistics included in the Data Graph:

- **Total # Flights:** The total number of flights included in the TMI (including canceled and exempt flights) for each particular power run scenario.
- **Affected # Flights:** The total number of flights that would be included in and affected by the TMI for each particular power run scenario (non-exempt and non-canceled flights only).
- **Total Delay:** The total amount of delay that would occur as a result of a TMI using each particular power run scenario.
- **Max Delay:** The maximum amount of delay (in minutes) that would be given to a flight using the parameters of a particular power run scenario.
- **Avg Delay:** The average amount of delay (in minutes) that would be given to flights using the parameters of a particular power run scenario.

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- **Max Air Hold:** The maximum amount of airborne holding (in minutes) that would be given to a flight using the parameters of a particular power run scenario.
- **Avg Air Hold:** the average amount of airborne holding (in minutes) that would be given to flights using the parameters of a particular power run scenario.
- **Stack:** The amount of flights that would be left in the "stack" after the TMI ends using the parameters of a particular power run scenario.
- **Unrec Delay:** Unrecoverable Delay. The amount of delay that will remain on flights even if you release the TMI right before the TMI start time for each particular power run scenario. FSM determines this value by setting the time to the TMI start time and performing the release delay function.
- **%Unrec:** This value is calculated by taking the Unrecoverable Delay and dividing it by Total Delay (Unrecoverable Delay/Total Delay). This is the percentage of delay that will remain even if delay is released at the TMI start time.
- **Delay Var:** The standard deviation of the carriers' average delay. This value is determined by taking the average delay of all carriers to see if they are similar. If the average delay is similar for all carriers, the delay variability is a small value. Larger deviation, or increased dissimilarity of average delay for all carriers, results in larger delay variability values.
- **EMA:** This is the Equity Metric for Airlines. This metric indicates how equitable, or fair, the proposed TMI is across airlines. Equity is determined by comparing the delay assigned in a proposed TMI to that which results using the airborne holding model. Any deviation from the airborne holding model must be viewed as decreasing equity. The values shown in this field are integers rounded from the calculated values. A value of 1 indicates that the TMI option results in delays exactly the same as those for airborne holding. A value from 2 to 8 indicates an option that still exhibits good equity, though the one with the lower value is still preferred. A value from 9 to 16 indicates an option with increasingly significant deviation from the standard. A value above 16 indicates an option with poor equity.
- **EMF:** This is the Equity Metric for Flights. This metric indicates how equitable, or fair, the proposed TMI is across flights. Equity is determined by comparing the delay assigned in a proposed TMI to that which results using the airborne holding model. any deviation from the airborne holding model must be viewed as decreasing equity. The values shown in this field are integers rounded from the calculated values. A value of 1 indicates that the TMI option results in delays exactly the same as those for airborne holding. A value from 2 to 8 indicates an option that still exhibits good equity, though the one with the lower value is still preferred. A value from 9 to 16 indicates an option with increasingly significant deviation from the standard. A value above 16 indicates an option with poor equity.

GDT Data Table Component

The GDT *Data Table* can be accessed by selecting **View** > *Data Table* in the GDT Setup component. The *Data Table* component contains all the same statistics as the *Data Graph*, only in tabular format (see Figure 9-17). The *Data Table* is used to look across a row for a particular statistic to find the best scenario. The same options that are displayed on the X-axis on the *Data Graph* are column headers in the *Data Table*.

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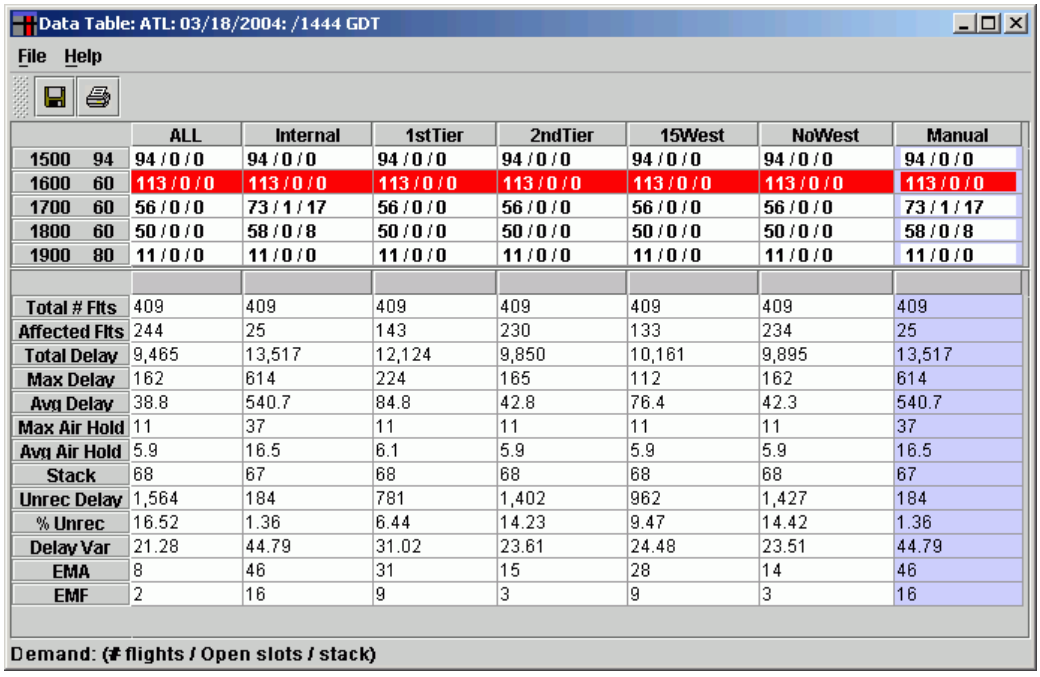

	ALL	Internal	1stTier	2ndTier	15West	NoWest	Manual
1500 94	94 / 0 / 0	94 / 0 / 0	94 / 0 / 0	94 / 0 / 0	94 / 0 / 0	94 / 0 / 0	94 / 0 / 0
1600 60	113 / 0 / 0	113 / 0 / 0	113 / 0 / 0	113 / 0 / 0	113 / 0 / 0	113 / 0 / 0	113 / 0 / 0
1700 60	56 / 0 / 0	73 / 1 / 17	56 / 0 / 0	56 / 0 / 0	56 / 0 / 0	56 / 0 / 0	73 / 1 / 17
1800 60	50 / 0 / 0	58 / 0 / 8	50 / 0 / 0	50 / 0 / 0	50 / 0 / 0	50 / 0 / 0	58 / 0 / 8
1900 80	11 / 0 / 0	11 / 0 / 0	11 / 0 / 0	11 / 0 / 0	11 / 0 / 0	11 / 0 / 0	11 / 0 / 0
Total # Flts	409	409	409	409	409	409	409
Affected Flts	244	25	143	230	133	234	25
Total Delay	9,465	13,517	12,124	9,850	10,161	9,895	13,517
Max Delay	162	614	224	165	112	162	614
Avg Delay	38.8	540.7	84.8	42.8	76.4	42.3	540.7
Max Air Hold	11	37	11	11	11	11	37
Avg Air Hold	5.9	16.5	6.1	5.9	5.9	5.9	16.5
Stack	68	67	68	68	68	68	67
Unrec Delay	1,564	184	781	1,402	962	1,427	184
% Unrec	16.52	1.36	6.44	14.23	9.47	14.42	1.36
Delay Var	21.28	44.79	31.02	23.61	24.48	23.51	44.79
EMA	8	46	31	15	28	14	46
EMF	2	16	9	3	9	3	16

Figure 9-17: Modeled ATL GDP: Data Table View

The Analysis Report

The Analysis Report is generated after you press **Run** from the *GDT Setup* component. To evaluate the effects of any delay operation, select **View** > *Analysis Report* from the Coversheet, as shown in Figure 9-18.

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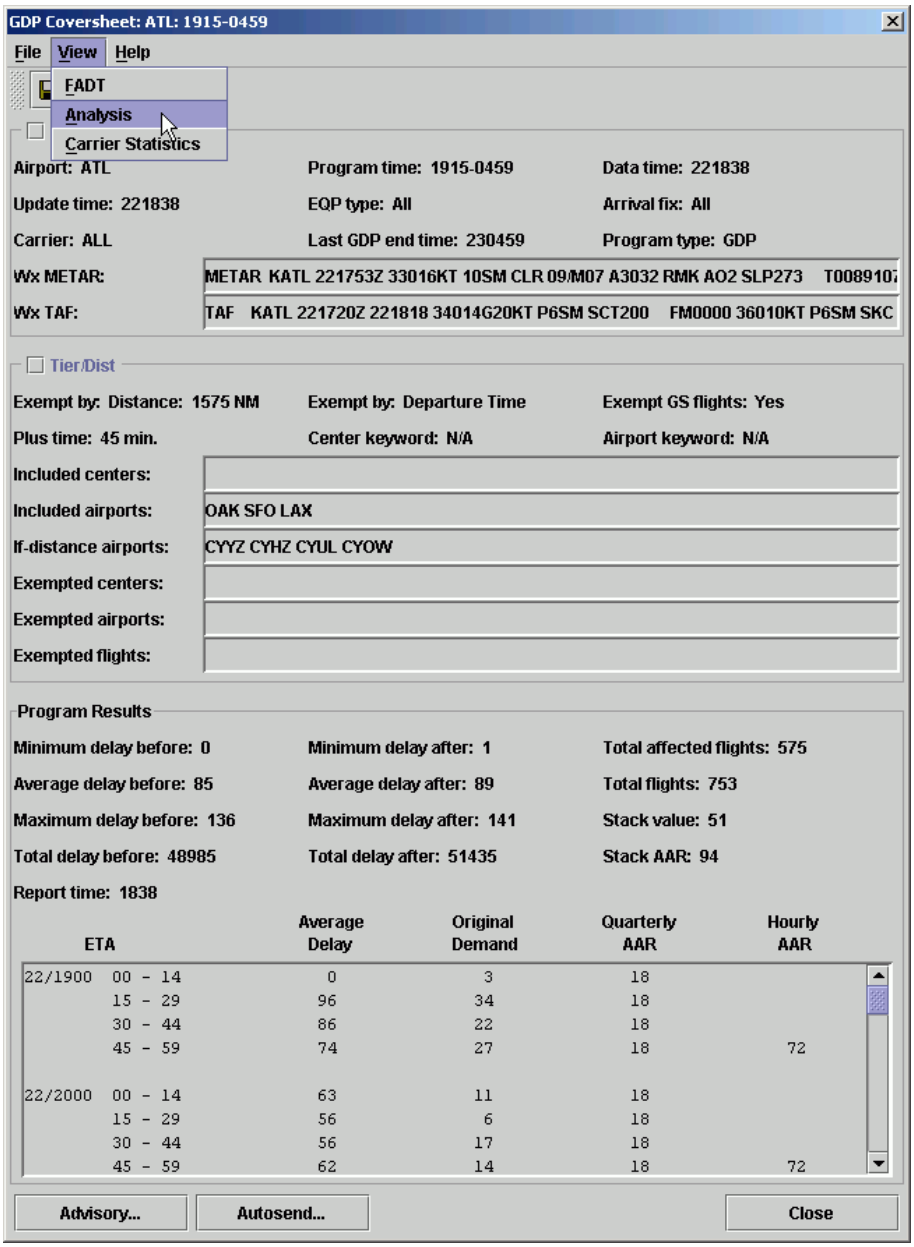

Figure 9-18: Coversheet

FSM automatically opens the spreadsheet application that you have indicated in your configuration files to display the Analysis Report.

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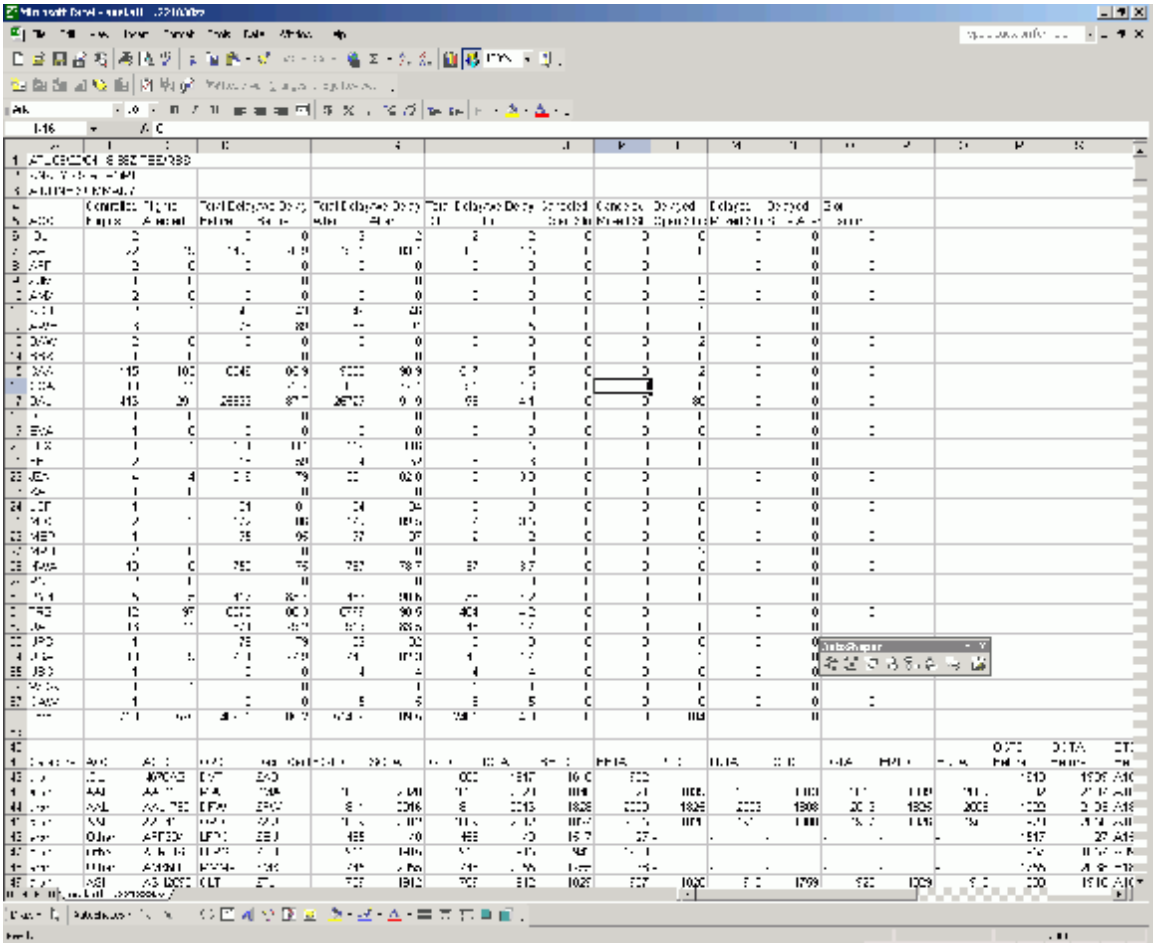

Figure 9-19: Analysis Report for ATL GDP

The Analysis Report contains pertinent information of the Ground Delay Operation that has just been run, including detailed slot information for individual airlines, delay statistics for before and after the operation, and arrival and departure information for individual flights (see Figure 9-19). The report contains two sections. One section reflects changes that occur as a result of RBS; the other section reflects changes that occur as a result of Compression. Included in the analysis are statistics for bridge-only carriers.

Reload the Data

If you have been developing a TMI for a while, you may have missed some incoming ADLs. Before sending out the final TMI parameters, you may want to update the data for your proposed TMI. To do this, simply click the **Reload** button on the GDT *Setup* component. The **Reload** button will only be activated when the actual data time is more recent than the data available in GDT mode. Pressing **Reload** will also **Model** the TMI event.

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10 Issuing an Initial Ground Delay Program

This chapter assumes that you have already modeled your Ground Delay Program (GDP) and you have decided that a GDP is the best Traffic Management Initiative (TMI) to control the demand at the airport you are monitoring. See Chapter 9 for more information on how to set and model your parameters.

Run to generate the GDP Coversheet

Click **Run** after your GDP setup has been completed and modeled from the *GDT Setup* component. Clicking the **Run** button will save the parameters to a file specified in FSM's configuration file and cause the GDP Coversheet to appear on the screen. Clicking **Run** will also generate three reports, a FADT, Analysis, and Carrier Statistics Report, which can be viewed by selecting **View** > *FADT, Analysis Report, or Carrier Statistics* from the Coversheet menu. See Coversheet Reports below for more information on reports.

> **Note:** If you have modeled your GDP, the red border around the *GDT Setup* Panel will not be present and the Run button is available. If you change any parameter in the *GDT Setup* component, you must press **Model** first, and then **Run**. Pressing **Reload** will reload the most current parameters and model at the same time.

The GDP Coversheet contains all the GDP parameters including the text fields for specific parameters. After reviewing the GDP parameters, you will need to send both an **Advisory** and use **Autosend** from the GDP Coversheet to issue the GDP, as shown in Figure 10-1.

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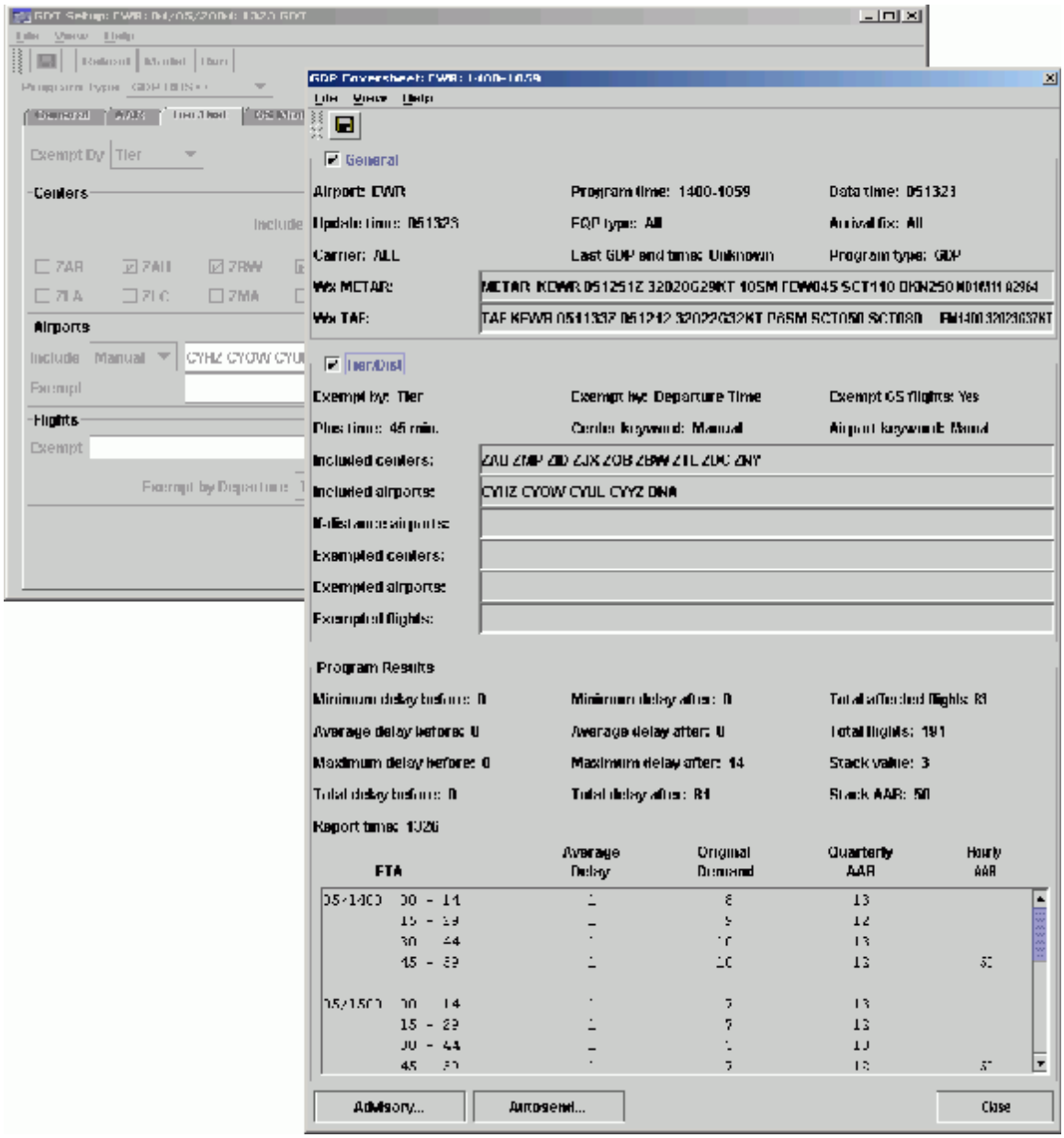

Figure 10-1: GDP Coversheet

Reviewing the program parameters is important before issuing the GDP. The following information is located on the GDP Coversheet under the *Program Input Parameters* section:

General Parameters

- **Airport**: The affected arrival airport where the GDP is issued.
- **Program Time**: The GDP time period (Start Time/End Time)
- **Data Time**: Current date and time (in Zulu time)
- **Update Time**: Last ADL time that passed before running the program.
- **EQP Type**: The GDP Equipment Type selected for the GDP

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- **Arrival Fix:** The arrival fixes of the affected airport being included in the GDP operation.
- **Carrier:** Carriers that operate at that airport are included in the GDP. This can be "All" or a single major carrier and its sub-carriers. A 3-letter airline code indicates that only one major carrier is included in GDP. A single carrier included in the GDP will always be a major carrier and its sub-carriers. It is never truly a "single" airline.
- **Last GDP End Time:** If this is not the first GDP of the day for the airport, the ending time of the last GDP run will appear here.
- **Program Type:** The type of program you have run. Either RBS, RBS++, or compression when you run a Ground Delay Program.
- **WX Metar***:* Metar information will automatically be filled in by FSM.
- **WX TAF***:* TAF information will automatically be filled in by FSM.

Tier/Dist Parameters:

- **Exempt by:** Lists if the program is either a **Tier** or **Distance** based. For Distance based GDPs, the distance of the range ring is listed in nautical miles.
- **Exempt by:** Lists if flights are exempt by **Departure Time** or **Departure Status.**
- **Exempt GS flights:** GS Stopped flights are exempted by status even when Exempt by Departure Time is selected on the Tier/Dist setup Tab when the Exempt by GS Flights checkbox is selected.
- **Plus time**- Flights that are exempt from the program because their departure time is within the current time + the value in the (min) field. This field has a default value of 45 minutes when Exempt by Departure Time is selected.
- **Center Keyword:** The center grouping keyword when issuing a tier-based program.
- **Airport Keyword:** The airport grouping keyword for Canadian airports.
- **Included Centers:** Centers included in the GDP operation. If there are too many centers to fit in the space provided, you will see "..." and can click the arrow at the end of the field to pull down a menu with a complete listing of the facilities involved.
- **Included Airports:** Airports included in the GDP operation. If there are too many airports to fit in the space provided, you will see "..." and can click the arrow at the end of the field to pull down a menu with a complete listing of the facilities involved.
- **If-Distance Airports:** Canadian Airports that will be included if they fall within the distance range. This field is only applicable during distance-based programs.
- **Exempted Centers**: Centers that are within the scope of the GDP but exempt from delay.
- **Exempted Airports:** Airports that are within the scope of the GDP but exempt from delay.
- **Exempted Flights***:* List of flights by call sign exempted from the GDP operation.

Program Results Summary

- **Minimum delay before:** The minimum delay given to any one flight included in the parameters before the program was run.

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- **Minimum delay after:** The minimum delay given to any one flight included in the parameters after the program was run.
- **Total Affected Flights:** Total number of flights included in the GDP operation (including cancelled flights) and the number of flights actually affected (non-exempt) by the GDP (excluding cancelled flights). Note that any ATC Delay statistics are determined by (Max [0, CTA - BETA]).
- **Average delay before:** Total delay of flights in the GDP operation divided by the Total Affected Flights in the operation before the program was run.
- **Average delay after:** Total delay of flights in the GDP operation divided by the Total Affected Flights in the operation after the program was run.
- **Total Flights:** The total numbers of flights arriving at the monitored airport within the program start and end time.
- **Maximum delay before:** The longest delay assigned to any one flight in the GDP before the program was run.
- **Maximum delay after:** The longest delay assigned to any one flight in the GDP after the program was run.
- **Stack Value:** Number of flights pushed out of the GDP period as a result of running the GDP.
- **Total delay before:** The sum of all delays resulting from this GDP operation in minutes before the program was run. Determined by CTA - OETA
- **Total delay after:** The sum of all delays resulting from this GDP operation in minutes after the program was run. Determined by CTA - OETA
- **Stack AAR:** The AARs that occur in the hours after the end time of the GDP, but that still have CTA flights in them because of GDP delay.
- **Report Time:** The current date and time in DDHHMM format. Note that the time is according to the 24-hour clock in Zulu time.

Scrolling Window Statistics

- **ETA**: Estimated Time of Arrival broken into 15-minute increments.
- **Average Delay**: Average delay for each 15-minute increment.
- **Original Demand**: Number of arrival flights for each 15-minute increment before running the GDP.
- **Quarterly AAR**: The Airport Arrival Rate set for each 15-minute increment after running the GDP.
- **Hourly AAR:** The Airport Arrival Rate for each hour during the GDP.

Re-Open the Coversheet

If you want to review previous Coversheets for the airport or if you accidentally closed the Coversheet before sending out the advisory, you can re-open it for review to continue sending out your program. Select **File** > *Open* from the GDT *Setup component*. This opens a file selection window for the Reports directory. You should see all Coversheets

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generated for that airport. Note that the Coversheet files are kept in the reports directory until you choose to delete them.

Coversheet files are generated when you run a new or revised GDP, Ground Stop, Compression, or Substitution. Coversheets are also generated when you purge (cancel) a program. You can differentiate between the different Coversheet files by looking at the last few letters in the file name. `GDP' indicates a GDP Coversheet. `GS' indicates a Ground Stop Coversheet. `COMP' indicates a Compression Coversheet. `SUBS' indicates a Substitution Coversheet.

A typical Coversheet file is named by: Type of file (for Coversheets, it is always covr), airport, 2-character date (just the day), time generated (HHMMSS), rate used, type of Coversheet (gdp, gs, comp, subs), and the center group included. For example, a file named "covr.SFO.28150808.3030.GDPNew.ALL" indicates a New GDP (first GDP of the day) Coversheet generated for SFO airport on the 28th at 1508Z with a 30 rate that includes all centers in the program.

Once you find the appropriate Coversheet file, click on the file name to select it and click Open. The Coversheet will open in FSM exactly as it appeared the first time it was generated. If the Coversheet is still valid to send out a program, the buttons at the bottom of the Coversheet will be enabled. If the Coversheet is no longer valid, the buttons are grayed out.

> **Note:** Even if the Coversheet is still valid, enough time may have passed that it would be better to generate a new program and Coversheet.

GDP Coversheet Menu Options

There are three file menu options available on the GDP Coversheet: **File, View** and **Help**.

1. **File Menu**

File > *Save As…*Opens a previously created coversheet in FSM. The default format is fsmc.<airport> followed by the date, time, and GDP information.

File > *Save Web coversheet As…*Saves the Coversheet information to a file for later use. Note that the Coversheet will save itself in a pre-defined file format that may not exactly match the software display on your computer monitor. The default format is covr.<airport> followed by the date, time, and GDP information.

File > *Close* - Closes the GDP Coversheet window

2. **View Menu**

View > *FADT* – Displays the FADT Report.

View > *Analysis* – Displays the Analysis Report.

View > *Carrier Statistics* – Displays the Carrier Statistic report

3. **Help Menu**

Help > *Coversheet* – Displays web-based on-line help information about the FSM Coversheet.

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Once the GDP Coversheet has been completed and all checkboxes are marked, you can either send out an **Advisory** or **Autosend** the GDP to the Hub site.

When you click **Advisory**, the Advisory Window is displayed, which allows you to send either a Proposed or an Actual Advisory to all FSM users. See *Sending an Advisory* on page 204 for more information.

When you click **AutoSend** from the GDP Coversheet, a popup menu will appear that allows you to specify what information from the FADT file you wish to send to those involved in the GDP (ALL, FA only, EDCTs only, or Cancel). See *Sending an Actual GDP (Autosend)* on page 206 for more information.

When you click **Close**, no action will be taken from the GDP Coversheet window.

Sending an Advisory

To compose either an Actual or Proposed GDP Advisory, click the **Advisory** button from the GDP Coversheet. The GDP Advisory window appears (see Figure 10-2). This window contains all the GDP parameters, which have been set by you and some fields in the *Remarks* sections that you must enter before sending an advisory.

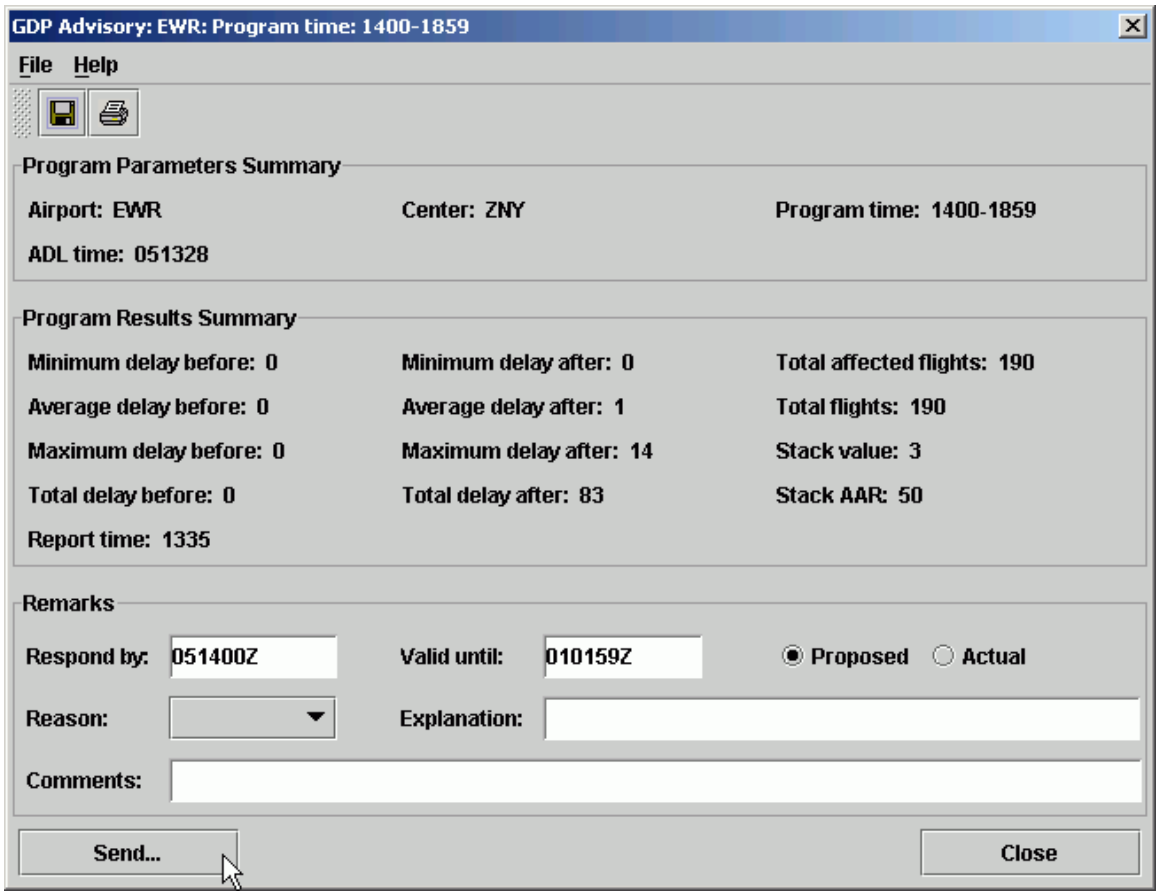

Figure 10-2: Send an Advisory

The following information is found in the GDP Advisory:

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Program Parameters Summary

- **Airport**: The airport for which a ground stop is being issued.
- **Center**: The center that includes the affected airport.
- **Program Time**: The times at which the GDP will start and end.
- **ADL Time**: The time of the last ADL used before the program was run.

Program Results Summary:

The Program Results summary on the Advisory window contains the exact same information as the GDP Coversheet Results Summary excluding the scroll window information.

Remarks

You must fill out the remarks section before sending an Advisory.

- **Respond By**: The time by which users must respond to a Proposed GDP. It is normally defined as the current time plus 30 minutes. That time is then rounded up to the next 15-minute time increment. For example, if the current time is 1812, the Respond By time is 1845 (1812 + 30 = 1842. Round up to the nearest 15-minute increment is 1845).
- **Valid Until**: The time at which the Advisory message will expire. Normally defined as the Respond By time plus 30 minutes and rounded up to the end of the hour. For example, if the Respond By time is 1845, the message is valid until **1959**. The message could also expire at the same time the program ends.
- **Proposed/Actual**: The two types of advisories available to send. A Proposed Advisory lets users know about a potential GDP and allows users to send comments about the parameters before the program is enacted. An Actual Advisory lets users know that a program will be issued and does not allow users to comment on the parameters.
- **Reason**: Select a reason for running the GDP from the available pull down menu. Click to pull the menu down and then click to select one of the available reasons: Weather, Volume, Runway, Equipment, and Other.
- **Explanation**: If you select "Other" in the Reason field, you must type a reason or other commentary in the Explain field before an Advisory can be sent.
- **Comments**: This field is available for any additional comments about the program you feel are necessary.

You must either select the **Proposed** or **Actual** radio button to send the appropriate Advisory. By default the Proposed radio button is selected.

- When a **Proposed Advisory** is sent, FSM will copy the Advisory file to an HP machine at the FAA's ATCSCC. It will also send the GDP parameters to Volpe for inclusion in the next ADL. A Proposed GDP is a program being recommended by the FAA, but not immediately implemented. A Proposed GDP allows NAS users time to comment on the proposed parameters thus allowing an "open-window" for changes in the program before it is implemented.

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- When an **Actual Advisory** is sent, FSM will copy the Advisory file to an HP machine at the FAA's ATCSCC and send the parameters to Volpe. However, Volpe will not send the program parameters in an ADL until it receives the matching FADT list with flight control times for the program. The FADT list is sent through the Autosend function on the GDP Coversheet (See *Sending an Actual GDP (Autosend)* below for more details).

Once you have completed the GDP Advisory, that Advisory can be either be saved to a specified directory on another computer or actually sent to the appropriate parties via email.

When you click **Send**, program parameters will be emailed to all parties involved in the program, including the Hub site. A checkmark will appear next to the **Send** button on the Advisory window and next to the **Advisory** button

on the GDP Coversheet to indicate that the advisory has already been sent. If the parameters are for a Proposed Advisory, the Hub site will send out the parameters immediately in the next ADL. When parameters for an Actual Advisory are sent, the Hub site will ensure that it has received the associated FADT file with flight control times for the program before sending any parameters through the ADL.

When you click **Close**, no action will be taken from the GDP Advisory window.

Sending an Actual GDP (Autosend)

An Actual GDP is a program that is going to be implemented by the FAA; user comments have already been gathered and the program is ready to be issued. If you are preparing an *Actual GDP*, you need to compose an Actual GDP Advisory as well as use the Autosend function on the GDP Coversheet to send the FADT list with flight control times.

Once you have determined program parameters for an Actual GDP, there are two steps needed to issue the program and send the parameters out through the ADL. Program parameters for an Actual program are not sent through the ADL until Volpe receives both the program parameters (through an Advisory) and a matching FADT list with flight control times. Once these are both received, the program parameters and control times are sent through the ADL to all FSM users and the program is implemented.

1. **Advisory** - From the GDP Coversheet, click Compose Advisory to complete the advisory for the actual program. The GDP Advisory window will appear (See *Sending an Advisory* on page 204). Complete the fields required in the GDP Advisory window, ensure that the "Actual" radio button is selected on the GDP Advisory. The advisory will contain the necessary program parameters for Hub site to send through the ADL.
2. **Autosend** - From the GDP Coversheet, click **Autosend**. This will bring up the **Autosend Progress bar** (see Figure 10-3). Pressing **Autosend** will send the entire FADT file to all users, including airlines. The Hub site will not send out any actual program information through the ADL unless there is an Actual Advisory with parameters matching the FADT.

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Note: If you choose Compose **Advisory** or **Autosend** more than 15 minutes after switching to GDT Setup, FSM will warn you to return to Monitor Mode (Live) and get the most recent data from an updated ADL before continuing with the Ground Delay Operation.

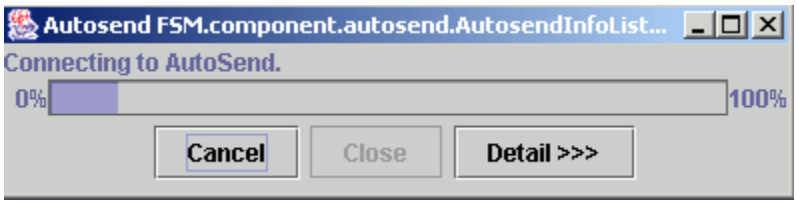

Figure 10-3: Autosend Progress bar

Coversheet Reports

FADT Report

FADT reports are generated when any TMI operation is **Run**. A FADT reports contains program parameters and delay statistics for that TMI operation. To review the FADT file, select **View** > *FADT Report* and the FADT Report window will appear displaying the program information (see Figure 10-4).

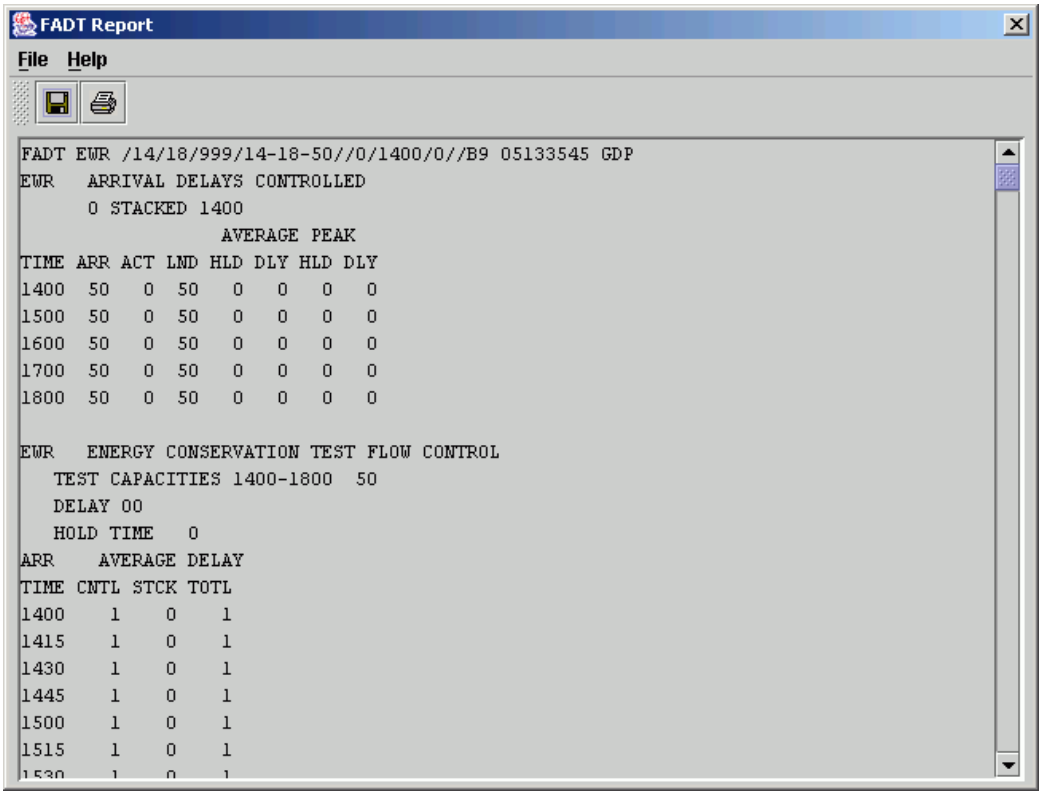

Figure 10-4: FADT Report

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Analysis Report

FSM also allows you to analyze programs after selecting "**Run**" from the *GDT Setup* component. To evaluate the effects of a ground delay operation after the operation ran; select **View** > *Analysis Report* from the Coversheet of any delay operation. (The Coversheet is generated when you click **Run** from a ground delay setup panel after setting the desired parameters). FSM automatically opens the spreadsheet application you have indicated in your configuration files to display the Analysis Report.

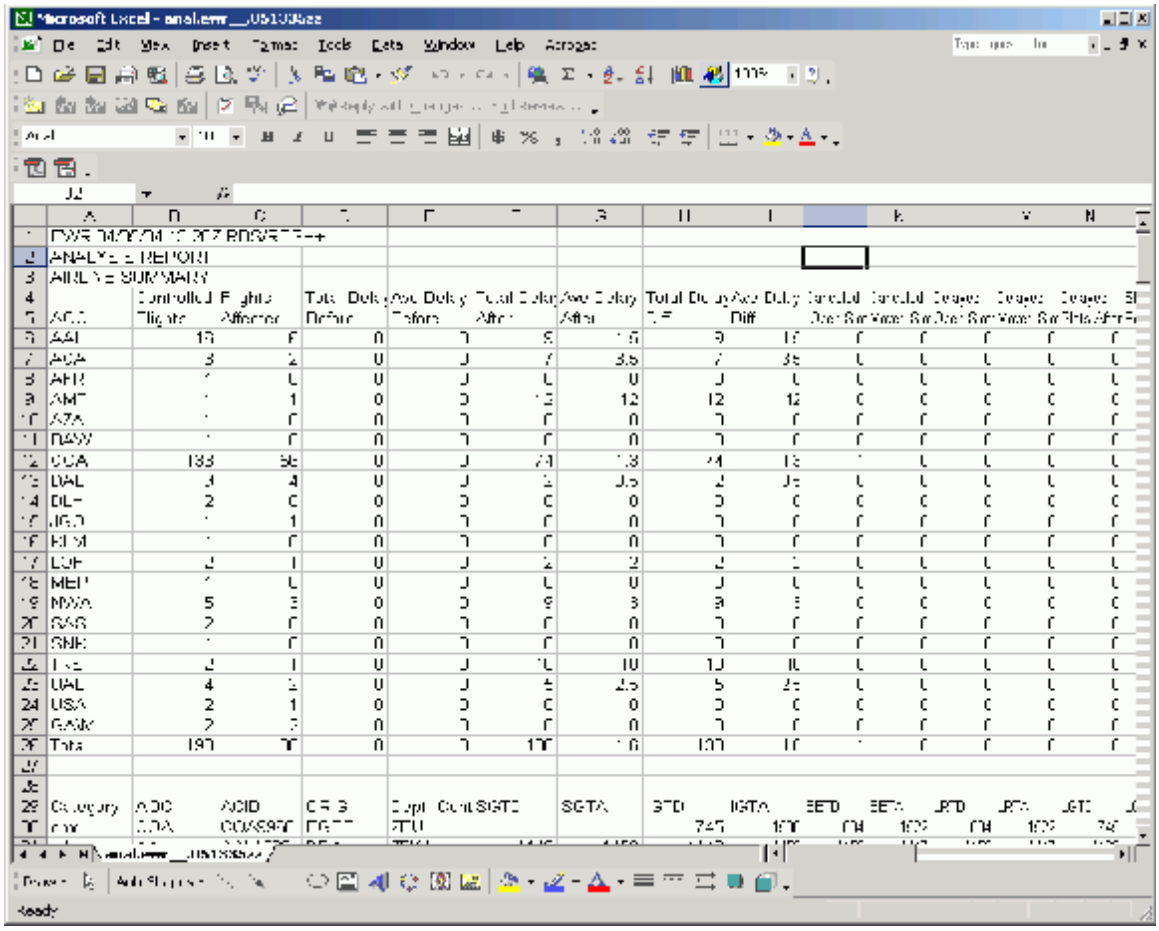

Figure 10-5: Analysis Report

The Analysis Report contains information pertinent to the Ground Delay Operation that just ran:

- Detailed slot information for individual airlines
- Delay statistics for before and after the operation
- Arrival and departure information for individual flights

The report contains two sections. One section reflects changes that occur as a result of RBS; the other section reflects changes that occur as a result of Compression.

Carrier Statistics

Carrier Statistics are generated when any TMI operation is **Run**. Carrier Statistics contain delay statistics for all carriers with flights that operate at that particular airport.

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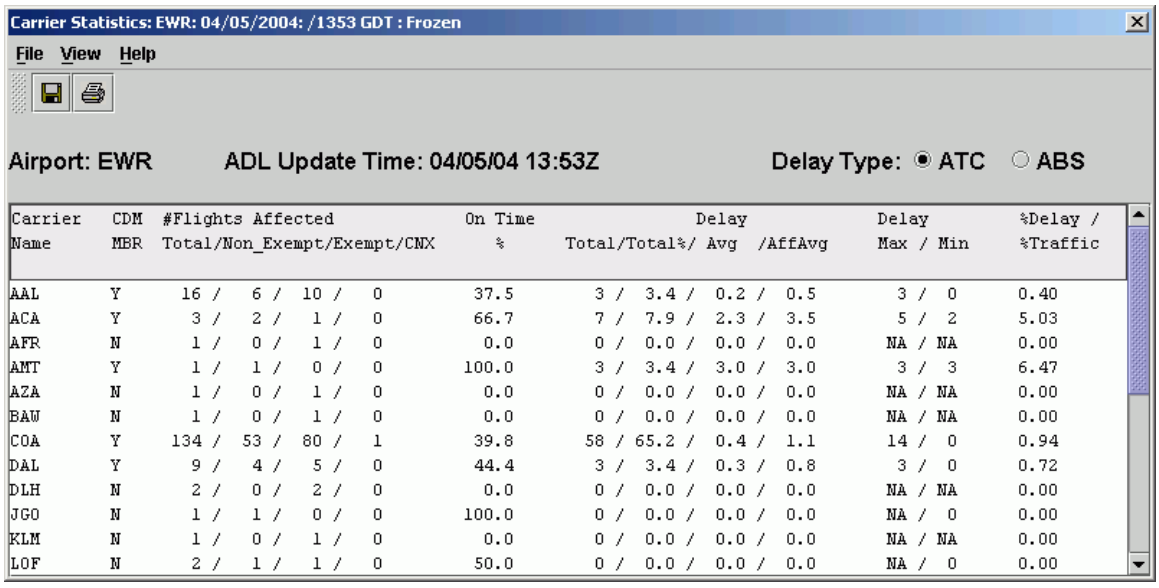
To review the Carrier Statistic file, select **View** > *Carrier Statistics* from the Coversheet to open the Carrier Statistics report (see Figure 10-6).



Carrier Name	CDM MBR	#Flights Affected Total/Non_Exempt/Exempt/CNX	On Time %	Delay Total/Total%/ Avg /AffAvg	Delay Max / Min	%Delay / %Traffic
AAL	Y	16 / 6 / 10 / 0	37.5	3 / 3.4 / 0.2 / 0.5	3 / 0	0.40
ACA	Y	3 / 2 / 1 / 0	66.7	7 / 7.9 / 2.3 / 3.5	5 / 2	5.03
AFR	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
AMT	Y	1 / 1 / 0 / 0	100.0	3 / 3.4 / 3.0 / 3.0	3 / 3	6.47
AZA	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
BAW	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
COA	Y	134 / 53 / 80 / 1	39.8	58 / 65.2 / 0.4 / 1.1	14 / 0	0.94
DAL	Y	9 / 4 / 5 / 0	44.4	3 / 3.4 / 0.3 / 0.8	3 / 0	0.72
DLH	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
JGO	N	1 / 1 / 0 / 0	100.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00
KLM	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
LOF	N	2 / 1 / 1 / 0	50.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00

Figure 10-6: Carrier Statistics Report

Only flights with assigned arrival slots will be calculated in the report metrics. That is, flights with a Control Time of Arrival (CTA) will show up in carrier statistics. If a carrier operates at the airport, but has no flights with a CTA, the Carrier Statistics report will display "0" or "N/A" in those rows. You can choose the type of delay to view in the report by clicking **Delay Type** radio button **ATC** or **ABS** at the top of the report. The **ATC** delay type is selected by default. ABS Delay is the *absolute delay* on a flight, including FAA and airline delay imposed on the flights. Absolute delay is calculated using Max (0, ETA - [IGTA - Taxi]). ATC Delay is the *delay imposed only by the FAA* on flights and is calculated using Max (0, CTA - BETA).

The report displays delay statistics for all carriers that operate at an airport. Carriers with no presence at the monitored airport will not show up in Carrier Statistics.

> **Note: View** > *Carrier Statistics* report is not available from a coversheet that has been opened from a file.

Purge a GDP

To purge (cancel) and release all delay on flights included in the GDP, use the Purge function from the GDT Setup Component. Selecting the Program Type Purge option on the GDT Setup Component is the same as using the Release Delay Option for the Blanket Program Type, See Chapter 16 for more details on the Program Type Blanket. The Purge option requires no user input. Once the Purge option is selected, all the features in the setup panel are grayed out. Click **Run** to generate the GDP Purge Coversheet (See Figure 10-7).

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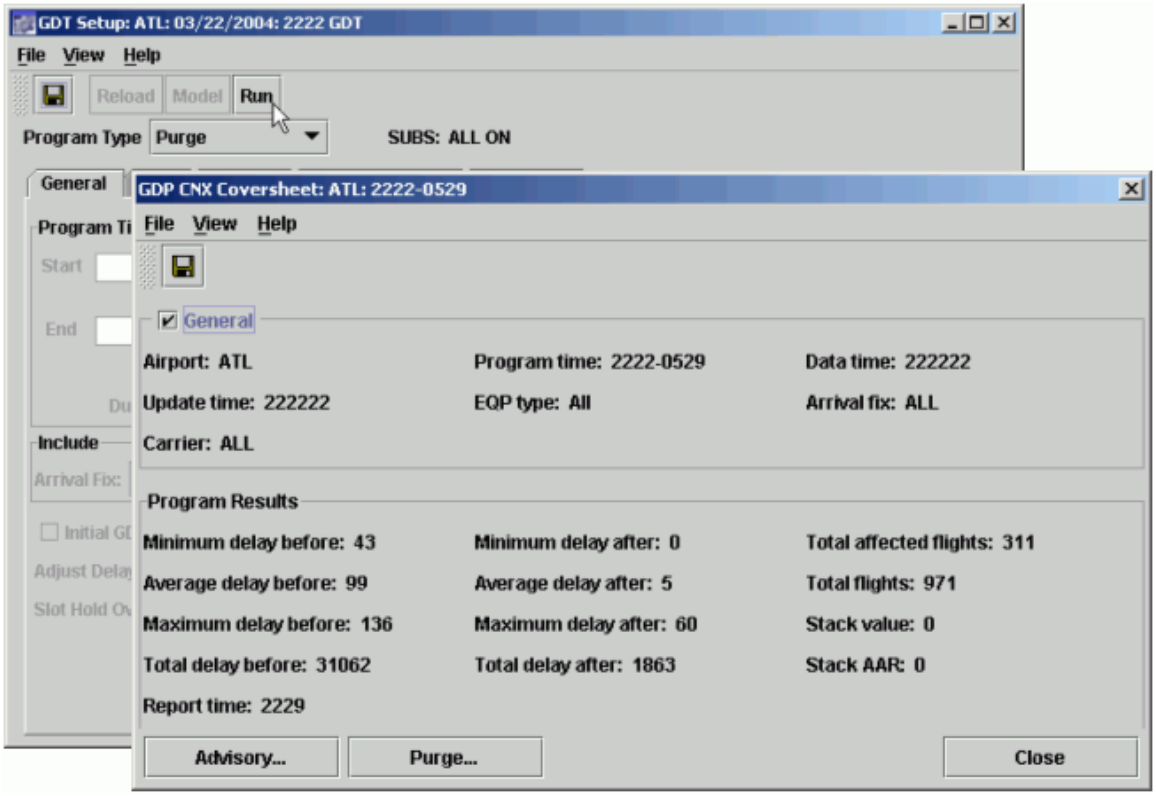

Figure 10-7: Purge Coversheet

The information included in the Purge Coversheet is pre-defined and cannot be changed. Information on the Purge Coversheet includes:

Program Input Parameters

- **Airport** - The airport for which the program is being implemented.
- **Program time** - The time period covered by the program. Default time period lasts until the latest ETA of the last CTA flight.
- **Data time** - The current Zulu time.
- **Update Time -** Last ADL time that passed before running the program.
- **EQP type**: The Equipment Type selected to be included in the GDP.
- **Arrival Fix** - Arrival fixes included in the program.
- **Carrier**- All carriers included in the GDP cancellation.

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Program Results

The Program Results summary on the Purge window contains the exact same information as the GDP Coversheet Results Summary excluding the scroll window information (see *Program Results Summary* on page 201).

From the **Purge Coversheet**, click **Purge** to purge any control times from the ETMS system. Purge works the same as the Autosend function to send new operation parameters and cancellation messages to the Hub site for inclusion in the ADLs. Note that the Hub site will wait for an Advisory for the canceled GDP before sending the new parameters. Finish the GDP cancellation by clicking **Advisory** and send a Purge advisory.

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11 Monitoring GDP Delivery

Introduction

When a Ground Delay Program (GDP) is in effect, you will want to monitor the progress of the program to ensure the program is affecting NAS operations in the intended manner. You also want to make sure that flights included in the program are complying with the program parameters. FSM generates various reports and statistics for monitoring a program's progress. In addition to FSM, Flight Schedule Analyzer (FSA) can also be used to help monitor a GDP.

Monitoring GDP Delivery using the Time Line and Bar Graph

Time Line Component

During a GDP, it is easy to view the *Time Line* to get a general idea of how evenly the flights are distributed throughout an hour and of how many canceled or delayed flights there are in the program. Delayed flights are represented by filled triangles. Filled triangles will only appear on the *Time Line* when there is a GDP in effect. The filled triangle indicates an open arrival slot due to a delayed flight. The arrival slot has been left open and is available for use by other flights. Clicking this icon will also highlight the associated delayed flight. The filled square icon will only appear when a GDP is in effect and represents an arrival slot left open by a canceled flight. Canceled flights are displayed on the *Time Line* under the CNX heading and will be highlighted when their associated slot is clicked. If there are numerous open slots, or solid triangles and squares, a compression or revision may be needed to utilize the empty slots. (See Table 11-1).

Table 11-1: Time Line Icons

Time Line Icon	Description
	Indicated the latest or current ADL file data update time in the Time Line component.
	A flight arriving at the monitored airport by ETA in the Time Line component and colored by the current color scheme.
	A flight departed from the monitored airport by ETD in the Time Line component and colored by the current color scheme.
	An open slot due to a canceled flight, which is included in a GDP. It is positioned at its arrival slot time and is colored by carrier.
	An open slot due to a canceled flight, which is not included in a GDP. It is positioned at its (IGTA-taxi) and colored by carrier.

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Time Line Icon	Description
	An open slot due to a delayed flight that is included in the GDP. It is positioned at its arrival slot time and colored by carrier. The corresponding flight is positioned at a later time matching the ETA.
	An open slot due to a delayed flight that is not included in the GDP. It is positioned at its (IGTA – taxi) and colored by carrier. The corresponding flight is positioned at a later time matching the ETA.

Bar Graph Component

During a GDP, use the *Bar Graph* component to view the distribution of flights, within each hour. To view how flights are distributed in smaller time increments click on the 15 or 30-minutes bin selection buttons located below the Bar Graph menu bar. The thin, white line displays the arrival flow rate, which illustrates the fluctuations of demand within the time-bins (see Figure 11-1). The default time increment is set to 60 minutes. In addition to viewing the flight distribution, you can view how many canceled flights there are in the program. Select **View** > *Show Cancellations* to display the canceled flights in cyan on the Bar Graph.

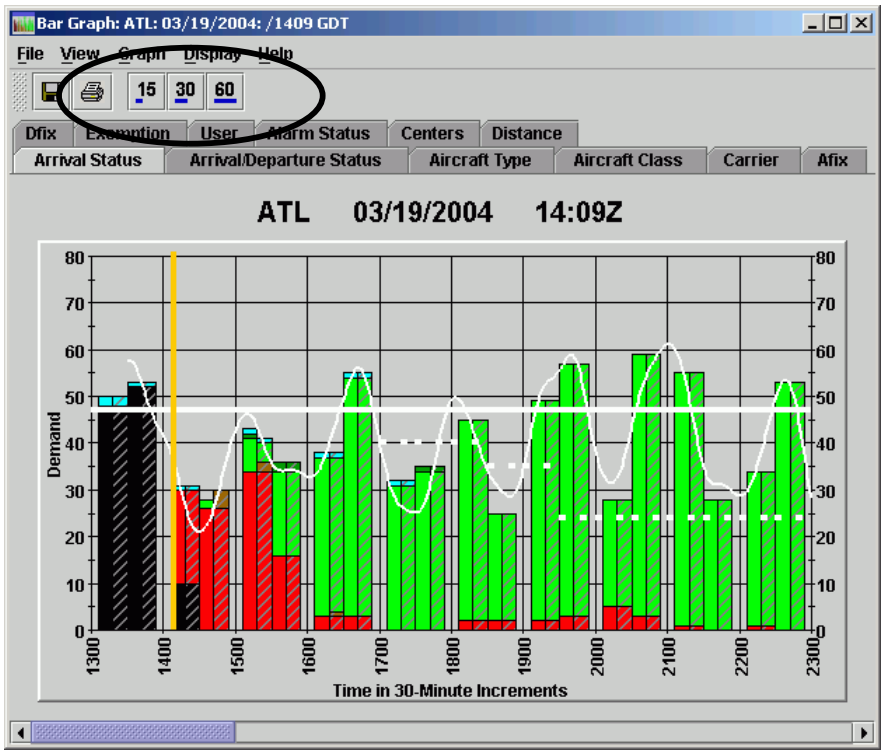

Figure 11-1: Bar Graph displayed in 30 minute Time Increments

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Monitoring Effects on NAS Users

Several reports can be opened from the **Reports** menu on the main *Control Panel* component and are useful to monitor the affects of the GDP.

Surface Delay Report

Reports > *Surface Delay* generates a report that indicates the ground delay imposed on flights. The report contains departure information for both arriving and departing flights. This report is very similar to an FSM Flight List and allows you to view histograms of both Absolute Delay and ATC Delay. See Chapter 6 for more information on Flight Lists.

Priority Flight List

Reports > *Priority Flights* - This report identifies priority flights. It is similar to an FSM Flight List, but only lists those flights tagged as Lifeguard (LFG) or Diversion Recovery (DVT) flights.

Time Out Delay List (Airline Only)

Reports > *Time Out Delay* - The intent of the Time Out Delay Report is to quickly provide a picture of which flights from your operation are contributing to the Time Out delay problem. Easier access to this information should help you review and resolve the problem. The report is in the same format as FSM Flight Lists and include all flights whose delay status has been marked as `TO.'

Time Out Cancel List (Airline Only)

Reports > *Time Out Cancel* - The intent of the Time Out Cancel Report is to quickly provide a picture of which flights from your operation are contributing to the Time Out cancel problem. Easier access to this information should help you review and resolve the problem. The report is in the same format as FSM Flight Lists and includes all flights whose cancellation status is `TO.'

Slot Hold

Reports > *Slot Hold* – This report generates a flight list of all flights that are currently holding their canceled slots.

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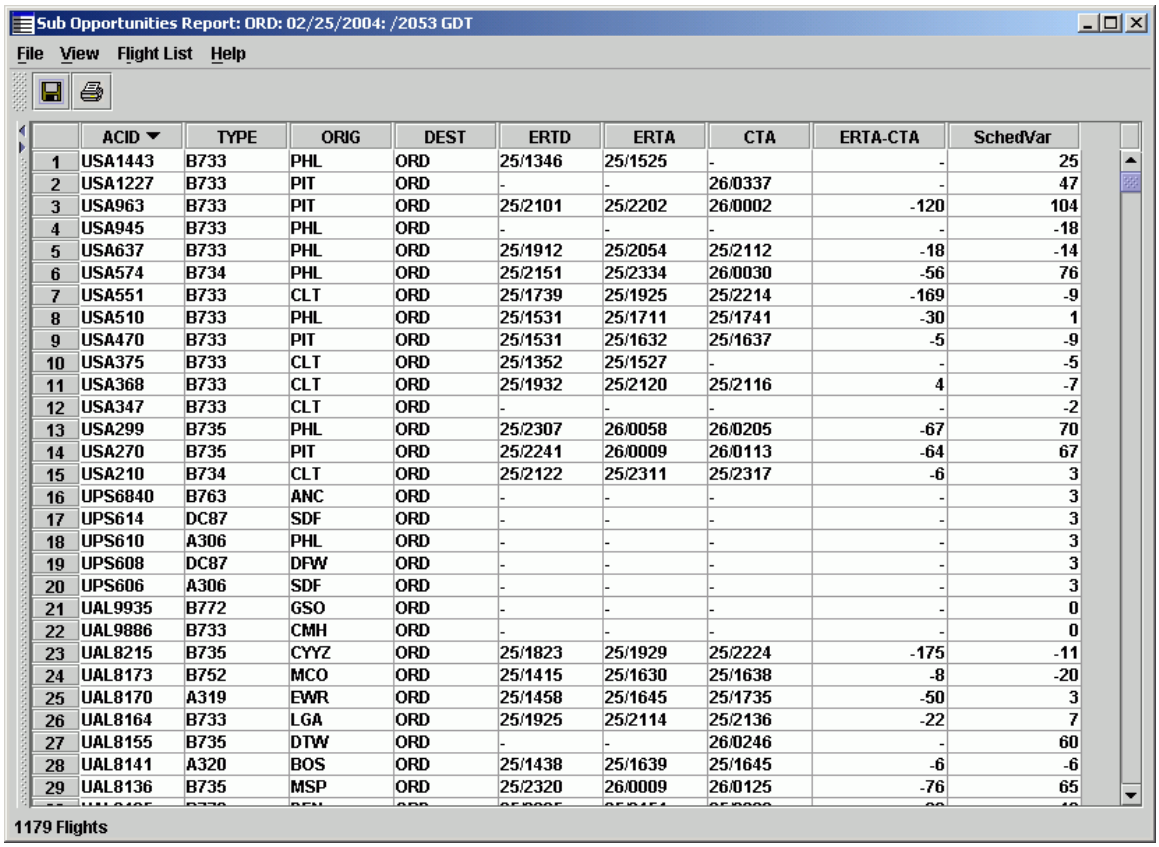
Sub Opportunities (Airline Only)

Reports > *Sub Opportunities* - This report generates a flight list to assist airlines and general aviation customers identify subbing opportunities. Two columns, ERTA-CTA and SchedVar, have been added to illustrate the most eligible flights to be subbed.



	ACID	TYPE	ORIG	DEST	ERTD	ERTA	CTA	ERTA-CTA	SchedVar
1	USA1443	B733	PHL	ORD	25/1346	25/1525	-	-	25
2	USA1227	B733	PIT	ORD	-	-	26/0337	-	47
3	USA963	B733	PIT	ORD	25/2101	25/2202	26/0002	-120	104
4	USA945	B733	PHL	ORD	-	-	-	-	-18
5	USA637	B733	PHL	ORD	25/1912	25/2054	25/2112	-18	-14
6	USA574	B734	PHL	ORD	25/2151	25/2334	26/0030	-56	76
7	USA551	B733	CLT	ORD	25/1739	25/1925	25/2214	-169	-9
8	USA510	B733	PHL	ORD	25/1531	25/1711	25/1741	-30	1
9	USA470	B733	PIT	ORD	25/1531	25/1632	25/1637	-5	-9
10	USA375	B733	CLT	ORD	25/1352	25/1527	-	-	-5
11	USA368	B733	CLT	ORD	25/1932	25/2120	25/2116	4	-7
12	USA347	B733	CLT	ORD	-	-	-	-	-2
13	USA299	B735	PHL	ORD	25/2307	26/0058	26/0205	-67	70
14	USA270	B735	PIT	ORD	25/2241	26/0009	26/0113	-64	67
15	USA210	B734	CLT	ORD	25/2122	25/2311	25/2317	-6	3
16	UPS6840	B763	ANC	ORD	-	-	-	-	3
17	UPS614	DC87	SDF	ORD	-	-	-	-	3
18	UPS610	A306	PHL	ORD	-	-	-	-	3
19	UPS608	DC87	DFW	ORD	-	-	-	-	3
20	UPS606	A306	SDF	ORD	-	-	-	-	3
21	UAL9935	B772	GSO	ORD	-	-	-	-	0
22	UAL9886	B733	CMH	ORD	-	-	-	-	0
23	UAL8215	B735	CYYZ	ORD	25/1823	25/1929	25/2224	-175	-11
24	UAL8173	B752	MCO	ORD	25/1415	25/1630	25/1638	-8	-20
25	UAL8170	A319	EWR	ORD	25/1458	25/1645	25/1735	-50	3
26	UAL8164	B733	LGA	ORD	25/1925	25/2114	25/2136	-22	7
27	UAL8155	B735	DTW	ORD	-	-	26/0246	-	60
28	UAL8141	A320	BOS	ORD	25/1438	25/1639	25/1645	-6	-6
29	UAL8136	B735	MSP	ORD	25/2320	26/0009	26/0125	-76	65

Figure 11-2: Sub Opportunities Report

Slot List

Reports > *Slot List* will generate the second part of the FADT List that was generated after a program was run. Included in the Slot List are the Aircraft Identification number (ACID), assigned slot time (ASLOT), departure center (DEP), controlled time of departure (CTD), controlled time of arrival (CTA), aircraft type (TYPE), exemption status (EX), cancellation status (CX), slot hold status (SH), earliest runway time of arrival (ERTA), and initial gate time of departure (IGTD). When you choose this option, a file selection window appears. Make sure the opened directory in the file selection window is the Reports directory. Enter a name for the file you will generate and click **Save**. You can then use **Utilities** > *View a File* to open your saved slot list (see Figure 11-3).

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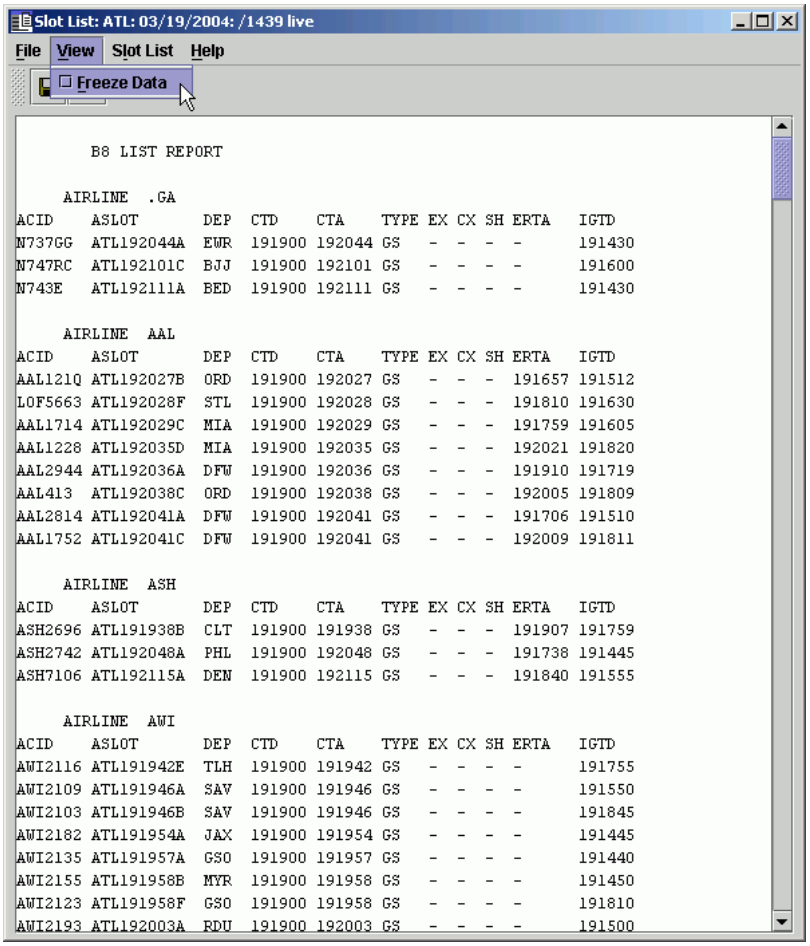

Figure 11-3: Reports > Slot List

Carrier Statistics

Reports > *Carrier Statistics* opens a report with delay statistics for all carriers with flights that operate at that particular airport. Only flights with assigned arrival slots will be calculated in the report metrics. That is, flights with a Control Time of Arrival (CTA) will show up in carrier statistics. If a carrier operates at the airport, but has no flights with a CTA, the Carrier Statistics report will display “0” or “N/A” in those rows. You can choose the type of delay to view in the report by clicking **Delay Type** radio button **ATC** or **ABS** at the top of the report. The **ATC** delay type is selected by default. ABS Delay is the *absolute delay* on a flight, including FAA and airline delay imposed on the flights. Absolute delay is calculated using Max (0, ETA - [IGTA - Taxi]). ATC Delay is the *delay imposed only by the FAA* on flights and is calculated using Max (0, CTA - BETA).

The report displays delay statistics for all carriers that operate at an airport. Carriers with no presence at the monitored airport will not show up in Carrier Statistics.

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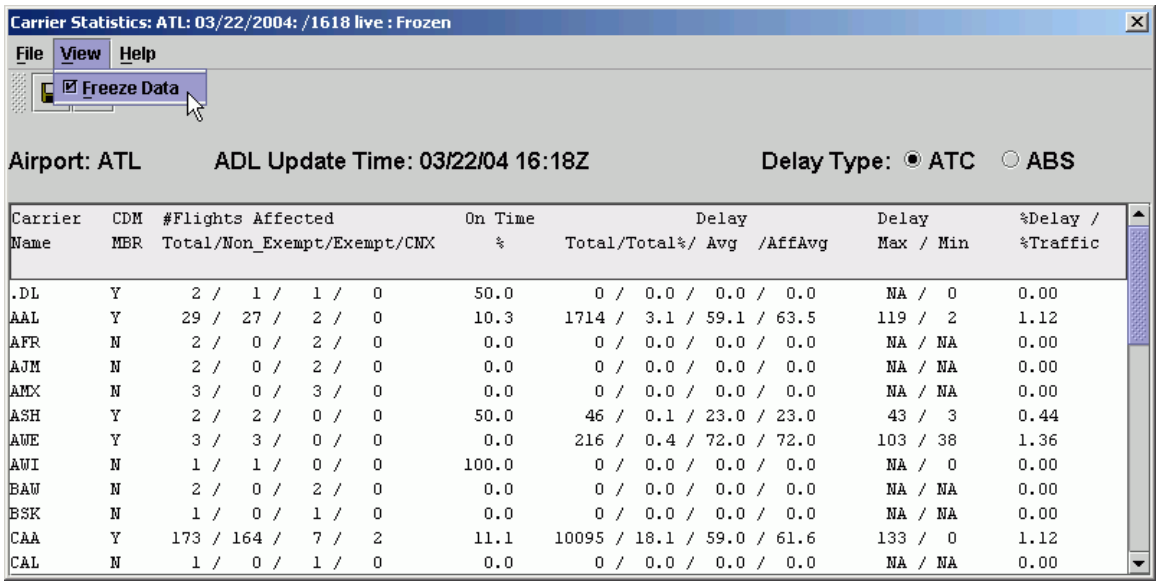

Carrier Name	CDM MBR	#Flights Affected Total/Non_Exempt/Exempt/CNX	On Time %	Delay Total/Total%/ Avg /AffAvg	Delay Max / Min	%Delay / %Traffic
.DL	Y	2 / 1 / 1 / 0	50.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00
AAL	Y	29 / 27 / 2 / 0	10.3	1714 / 3.1 / 59.1 / 63.5	119 / 2	1.12
AFR	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
AJM	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
AMX	N	3 / 0 / 3 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
ASH	Y	2 / 2 / 0 / 0	50.0	46 / 0.1 / 23.0 / 23.0	43 / 3	0.44
AWE	Y	3 / 3 / 0 / 0	0.0	216 / 0.4 / 72.0 / 72.0	103 / 38	1.36
AWI	N	1 / 1 / 0 / 0	100.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00
BAW	N	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
BSK	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
CAA	Y	173 / 164 / 7 / 2	11.1	10095 / 18.1 / 59.0 / 61.6	133 / 0	1.12
CAL	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00

Figure 11- 11-4: Carrier Statistics

The following information is displayed in the Carrier Statistics Report:

Carrier Name: The airline for which the delay data corresponds.

CDM MBR: 'Y' indicates that the carrier is a CDM member. 'N' indicates that the carrier is not a CDM member.

 # Flights Affected – Total/Non_Exempt/Exempt/CNX:

- **Total:** Gives the total number of flights for the specified time period.
- **Non-Exempt:** The total flights that are Non-Exempt (included) in the program.
- **Exempt:** The total flights that are Exempt (receive no delay) from the program.
- **CNX:** The total flights that are canceled (CNX).

On Time % : Displays the percentage of flights which will arrive within 15 minutes of their ETA

Delay - Total/Total%/Avg/AffAvg:

- **Total:** Shows the total minutes of delay for each airline.
- **Total % :** When the total delay minutes for an airline are divided by the total delay minutes for all airlines combined, the resulting value is the percentage of delay attributed to the airline.
- **Avg :** Displays the Average Delay minutes on a carrier's total number of flights.
- **Aff Avg**: Displays the Average Delay minutes for the carrier's flights affected by a program.

Delay - Max/Min:

- **Max:** Gives the values for the maximum delay amounts that a carrier's flights could receive.

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- **Min:** Gives the values for the minimum delay amounts that a carrier's flights could receive.

% Delay / % Traffic: Indicates the delay equity for a carrier at an airport. A value of "1" in this column means that a carrier's delay is perfectly equitable. A value greater than "1" indicates a carrier will receive worse than average delay. A value less than "1" indicates that a carrier will receive less than average delay.

The bottom of the report gives the same statistics for Scheduled/Non-Scheduled flights.

Monitoring Flight Compliance

FSM generates Compliance List reports for monitored airports currently in a GDP. Under the **Reports** > *Compliance* > menu option on the main *Control Panel* you will find five compliance reports: *By CTD, By ETE, By CTA, Spurious Flight,* and *Cancel That Flew.* The compliance reports are automatically updated with every ADL for all airports whose data is being collected by FSM. Compliance reports will only include those flights arriving at the currently monitored airport. The list you generate will be for the airport that you were last viewing, therefore ensure that the desired airport is in focus before selecting the Compliance report. The Compliance reports are viewed in the same format as all FSM Flight Lists, see Chapter 6 for more information on Flight Lists.

Reports > *Compliance > By CTD*

The **By CTD** Compliance report checks for flights included in a delay program, which violate departure compliance. The default departure boundaries are more than 5 minutes before or more than 5 minutes after their estimated departure clearance time. Any flight that has an ARTD of 5 minutes earlier or 5 minutes later than the most recent OrigEDCT will be included in the CTD Compliance report, as shown in Figure 11-5.

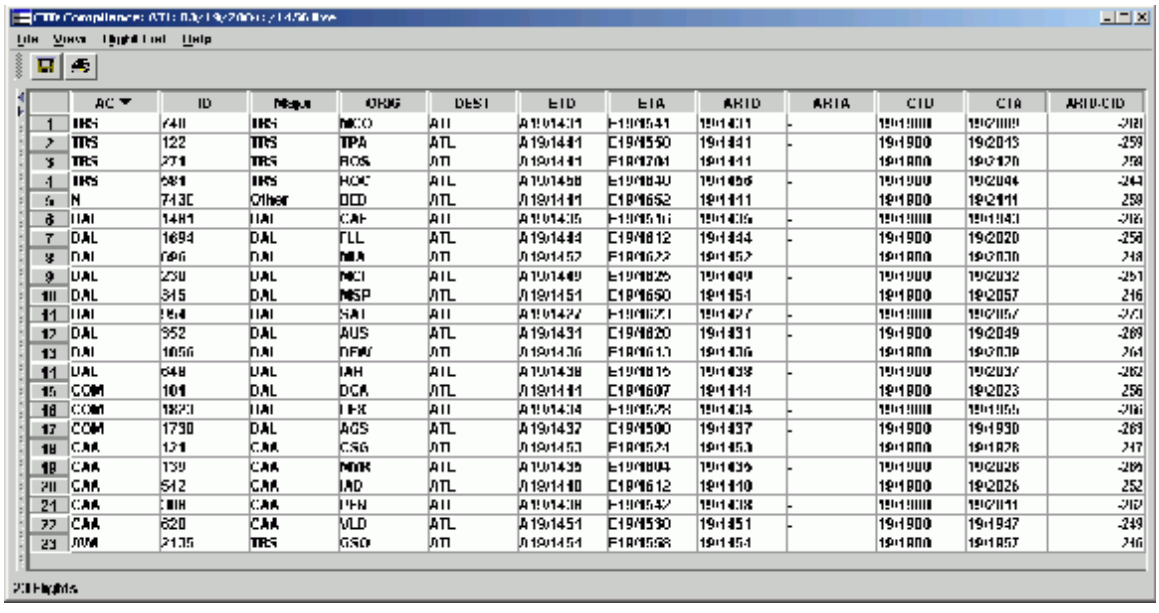

Figure 11-5: CTD Compliance

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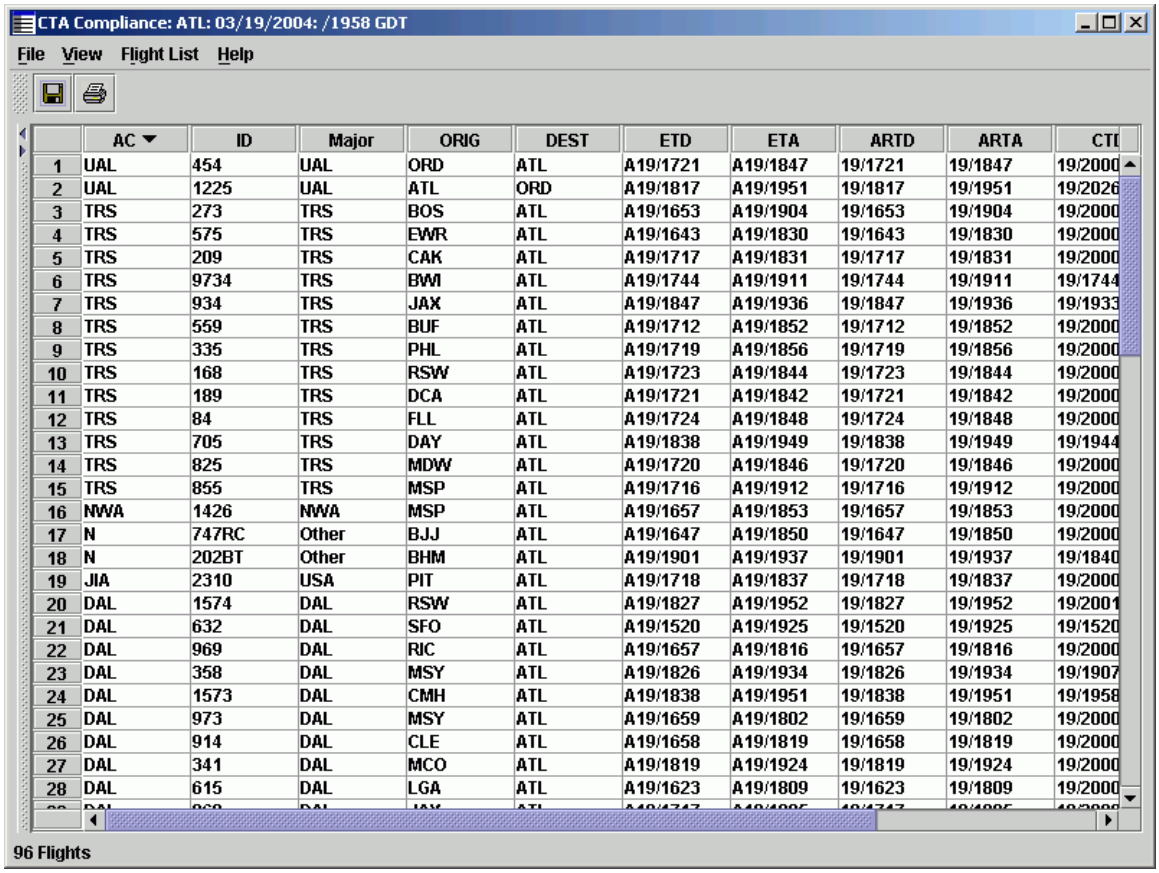
Reports > *Compliance > By ETE*

The **By ETE** Compliance report compares the Actual ETE vs. Original ETE. Flights are included in the *By ETE* Compliance report when the difference between the ETE estimated by ETMS and actual flight time is greater than a specified value, but the flight status is not "canceled." The default value is 15 minutes. ETMS estimates ETE using OCTA - OCTD. Actual flight time is calculated using ARTA - ARTD. Its format is very similar to Figure 11-5.

Reports > *Compliance > By CTA*

The **By CTA** Compliance reports checks for flights included in a delay program, which violate arrival compliance. By default, flights that violate arrival compliance are defined as those flights arriving more than 5 minutes before or more than 5 minutes after their Control Time of Arrival. If any of the specified conditions are detected, the flight will be included in the **By CTA** Compliance Flight List, as shown in Figure 11-6.



	AC	ID	Major	ORIG	DEST	ETD	ETA	ARTD	ARTA	CTI
1	UAL	454	UAL	ORD	ATL	A19/1721	A19/1847	19/1721	19/1847	19/2000
2	UAL	1225	UAL	ATL	ORD	A19/1817	A19/1951	19/1817	19/1951	19/2026
3	TRS	273	TRS	BOS	ATL	A19/1653	A19/1904	19/1653	19/1904	19/2000
4	TRS	575	TRS	EWR	ATL	A19/1643	A19/1830	19/1643	19/1830	19/2000
5	TRS	209	TRS	CAK	ATL	A19/1717	A19/1831	19/1717	19/1831	19/2000
6	TRS	9734	TRS	BWI	ATL	A19/1744	A19/1911	19/1744	19/1911	19/1744
7	TRS	934	TRS	JAX	ATL	A19/1847	A19/1936	19/1847	19/1936	19/1933
8	TRS	559	TRS	BUF	ATL	A19/1712	A19/1852	19/1712	19/1852	19/2000
9	TRS	335	TRS	PHL	ATL	A19/1719	A19/1856	19/1719	19/1856	19/2000
10	TRS	168	TRS	RSW	ATL	A19/1723	A19/1844	19/1723	19/1844	19/2000
11	TRS	189	TRS	DCA	ATL	A19/1721	A19/1842	19/1721	19/1842	19/2000
12	TRS	84	TRS	FLL	ATL	A19/1724	A19/1848	19/1724	19/1848	19/2000
13	TRS	705	TRS	DAY	ATL	A19/1838	A19/1949	19/1838	19/1949	19/1944
14	TRS	825	TRS	MDW	ATL	A19/1720	A19/1846	19/1720	19/1846	19/2000
15	TRS	855	TRS	MSP	ATL	A19/1716	A19/1912	19/1716	19/1912	19/2000
16	NWA	1426	NWA	MSP	ATL	A19/1657	A19/1853	19/1657	19/1853	19/2000
17	N	747RC	Other	BJJ	ATL	A19/1647	A19/1850	19/1647	19/1850	19/2000
18	N	202BT	Other	BHM	ATL	A19/1901	A19/1937	19/1901	19/1937	19/1840
19	JIA	2310	USA	PIT	ATL	A19/1718	A19/1837	19/1718	19/1837	19/2000
20	DAL	1574	DAL	RSW	ATL	A19/1827	A19/1952	19/1827	19/1952	19/2001
21	DAL	632	DAL	SFO	ATL	A19/1520	A19/1925	19/1520	19/1925	19/1520
22	DAL	969	DAL	RIC	ATL	A19/1657	A19/1816	19/1657	19/1816	19/2000
23	DAL	358	DAL	MSY	ATL	A19/1826	A19/1934	19/1826	19/1934	19/1907
24	DAL	1573	DAL	CMH	ATL	A19/1838	A19/1951	19/1838	19/1951	19/1958
25	DAL	973	DAL	MSY	ATL	A19/1659	A19/1802	19/1659	19/1802	19/2000
26	DAL	914	DAL	CLE	ATL	A19/1658	A19/1819	19/1658	19/1819	19/2000
27	DAL	341	DAL	MCO	ATL	A19/1819	A19/1924	19/1819	19/1924	19/2000
28	DAL	615	DAL	LGA	ATL	A19/1623	A19/1809	19/1623	19/1809	19/2000

Figure 11-6: CTA Compliance

Reports > *Compliance > Spurious Flight*

The **Spurious Flight** Compliance report detects the cancellation of false flights used to ignite a substitution stream. Flights submitted as FX cancellations with no corresponding entries in the OAG will be included in the **Spurious Flight** List.

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Reports > *Compliance > Cancel But Flew*

The *Cancel But Flew* Compliance report included any flight that was canceled and later flew.

Monitoring Program Parameters

Program parameter alerts for all monitored airports are found under the **Alerts** menu on the main *Control Panel* component. All monitored airports are listed in alphabetical order under the **Alerts** menu. When an airport's parameters are updated, the **Alerts** menu will be highlighted in red as well as the monitored airport and its corresponding updated parameters. Figure 11-7 displays MDW airport with FADT Parameters and SCS Bridge parameters updated. ATL and BOS airports have no updated parameters. Once you have read the updated parameters, the parameter color will return to its original state. FSM will list the parameters of the airport currently in focus on the main Alerts drop-down. Clicking on the other airports will activate a pop-up box that displays the parameters for the selected airport. If you change the focus to another airport, the Alerts menu will change accordingly.

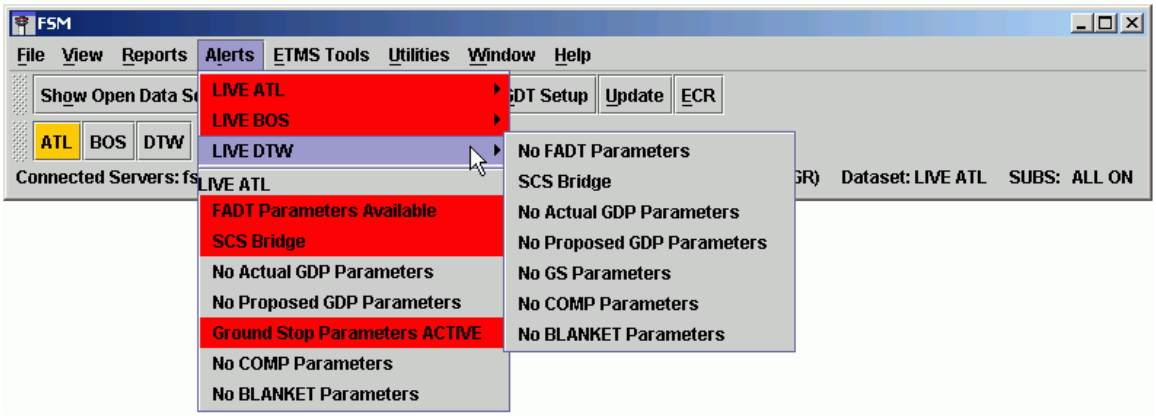

Figure 11-7: Alerts Menu

FADT Parameters Updated

Alerts > *FADT Parameters Updated* will be highlighted in red when there has been a new FADT. Selecting *FADT Parameters Updated* will display a pop-up window that lists the FADTs generated during the day for the selected airport in [ddhhmmss] format (see Figure 11-8). This option does not actually give you program parameters. FADTs are reports generated when a Ground Delay Program, Ground Stops, Blanket, or a Compression operation is run. Note that the FADTs are not always listed in chronological order.

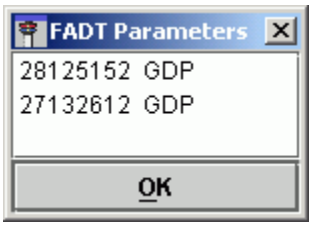

Figure 11-8: FADT Parameters Window

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SCS Bridge

Alerts > *SCS Bridge* will be highlight red in color when there has been a new SCS update. Selecting *SCS Bridge* will display the Substitution Flag Block window, which displays the current subbing status (see Figure 11-9). The Substitution Flag Block may contain the following keywords:

- **SUBS:** Indicates whether all substitutions are enabled (ON or disabled (OFF))
- **SCS:** Indicates whether slot credit substitutions for all operators are enabled (ON) or disabled (OFF)
- **BRIDGING:** Indicates whether bridging subs are disabled (OFF) for a particular operator (airline, GA, or MILITARY). If bridging is off for an airline, any flight whose MAJOR field or carrier code (from ACID) matches the airline name will not be used for an SCS bridge. If bridging is enabled for an operator, no line will appear, that is, the only allowed value for this keyword is OFF.

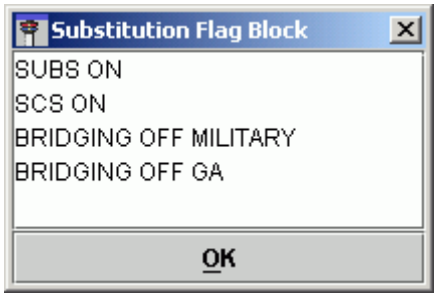

Figure 11-9: SCS Flag Block Window

Note: By default, Military and GA bridging is turned off.

GDP Parameters

Alerts > *Actual GDP Parameters Available* is highlighted in red when Actual GDP Parameters are received through the ADL. First-time GDP Parameters, new GDP Parameters, and deleted GDP Parameters will all trigger this Alert. Click *Actual GDP Parameters Available* to view the parameters that are taken from the FADT file and displayed in a static *GDT Se*tup window (see Figure 11-10). Tab navigation allows you to view all the parameters, although no changes can be made to this window. If there are no Actual GDP Parameters, the text reads *No Actual GDP Parameters.*

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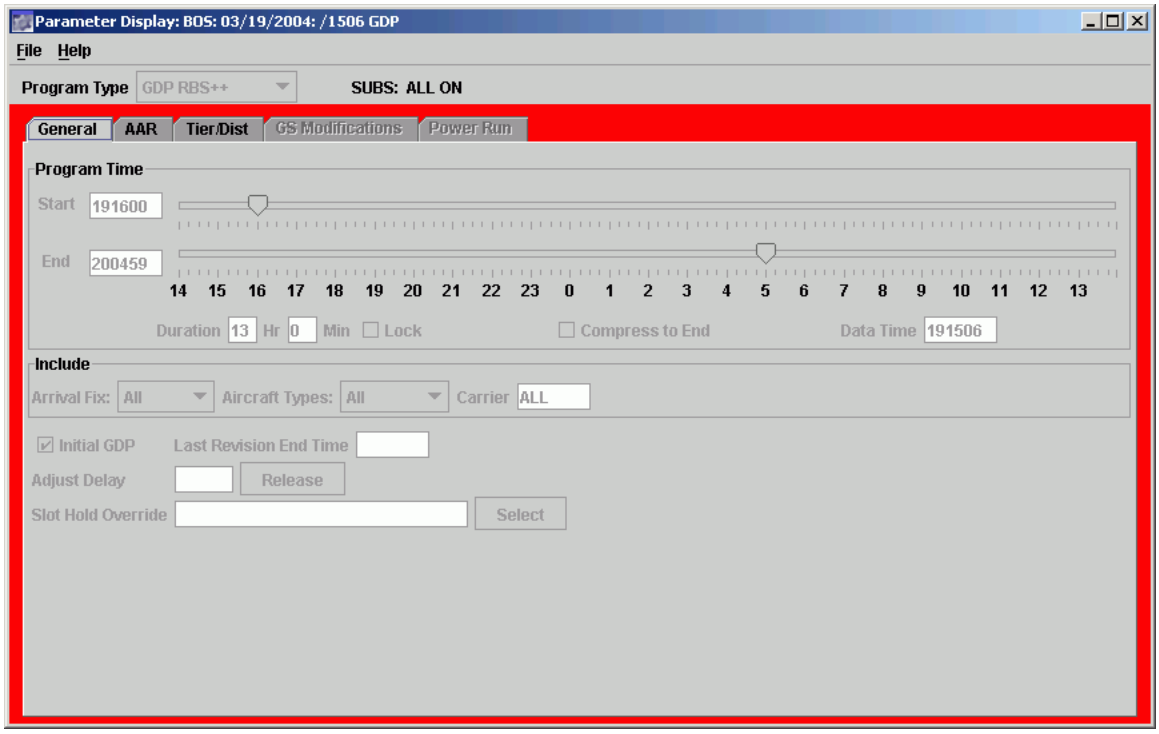

Figure 11-10: Actual GDP Parameter Display Window

Alerts > *Proposed GDP Parameters Available* is highlighted in red when parameters for a Proposed GDP arrive through the ADL. Click *Proposed GDP Parameters Available* to view the proposed parameters, which are taken from the FADT file and displayed in a static GDP Setup window. Tab navigation allows you to view all the proposed GDP parameters, although no changes can be made to this window. If there are no Proposed GDP Parameters, the text reads *No Proposed GDP Parameters*.

GS Parameters

Alerts > *GS Parameters Active* is highlighted in color when a Ground Stop is issued and its parameters are received through the ADL. First-time GS Parameters, new GS Parameters and deleted GS parameters will all trigger this Alert. Click *GS Parameters Available* to view the parameters, which are taken from the FADT file and displayed in a static GDP Setup window (see Figure 11-11). Tab navigation allows you to view all the GS parameters, although no changes can be made to this window. If there are no GS Parameters, the text reads *No GS Parameters*.

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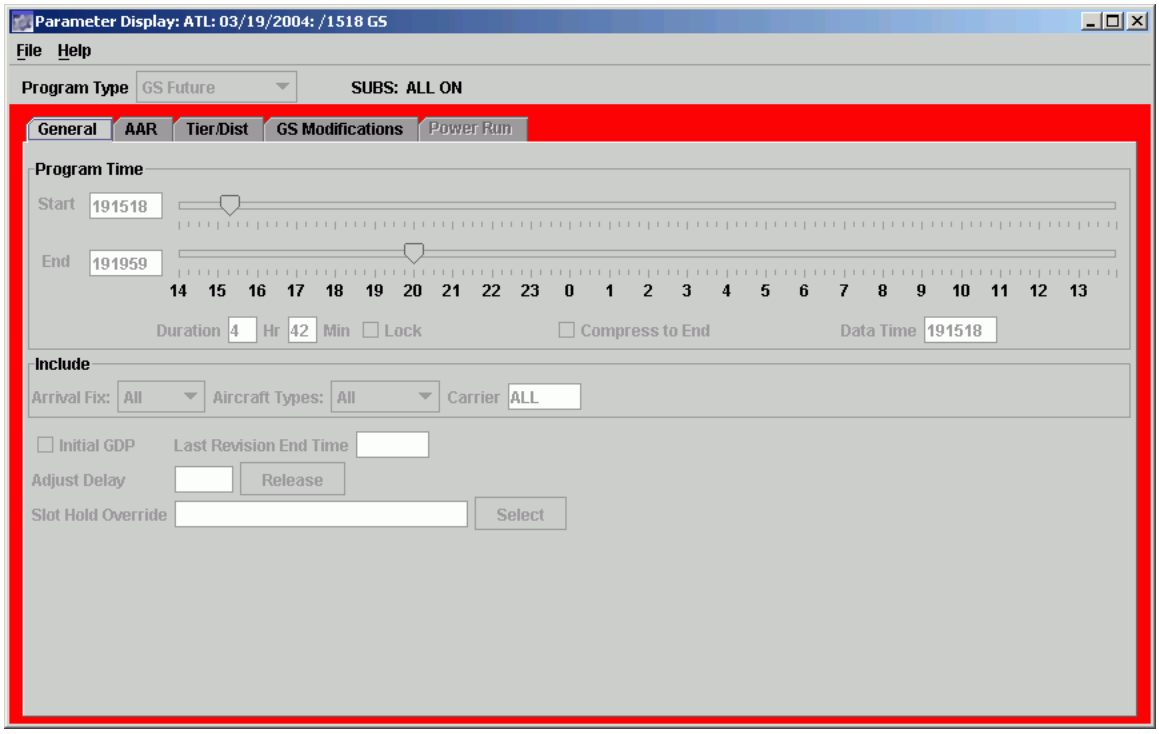

Figure 11-11: Actual GS Parameters Window

Compression Parameters

Alerts > *Compression Parameters Available* is triggered when parameters for the compression function are received through the ADL. When Compression parameters arrive, *Compression Parameters Available* will be highlighted in red for the corresponding airport. Click *Compression Parameters Available* to view the new parameters, which are taken from the FADT file and displayed in a static GDP Setup window. Tab navigation allows you to view compression parameters, although no changes can be made to this window. If there are no Compression Parameters available, the text reads *No Compression Parameters*.

Blanket Parameters

Alerts > *Blanket Parameters Available* is triggered when delay is lifted or added to a ground delay program by the FAA. When the message to add or remove delay for all flights is received through the ADL, the Blanket Parameters Available text will be highlighted in red. Click this menu option to view the new parameters, which are taken from the FADT file and displayed in text format in the Blanket Parameters window. If there are no Blanket Parameters available, the text reads *No Blanket Parameters*.

Monitoring a GDP using Real-Time FSA (RT-FSA)

Real-time FSA is a web-based application that allows you to monitor Ground Delay Programs (GDPs) as they are executing. FSA generates nine different types of reports: Performance, Flight Status, Compliance, CTD before PGTD, Cancels That Flew, Pop-Ups, Time Out Delay, Duplicate Flights, and GDP Events. These reports are updated every five minutes, with the most current Airport Demand List (ADL) information. The information provided in these reports will help you identify problems as they are

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happening, so action can be taken to correct problems that are impacting GDP performance.

Accessing the Reports

The RT FSA reports are viewed using your internet browser. To access the reports

- Start your web browser
- Go to the ATCSCC homepage http://www.atcscc.tfmi.nas.faa.gov/
- Select the "Operational Information System (OIS)" link.
- Select the FSA link from the bottom left hand side menu on the OIS page.

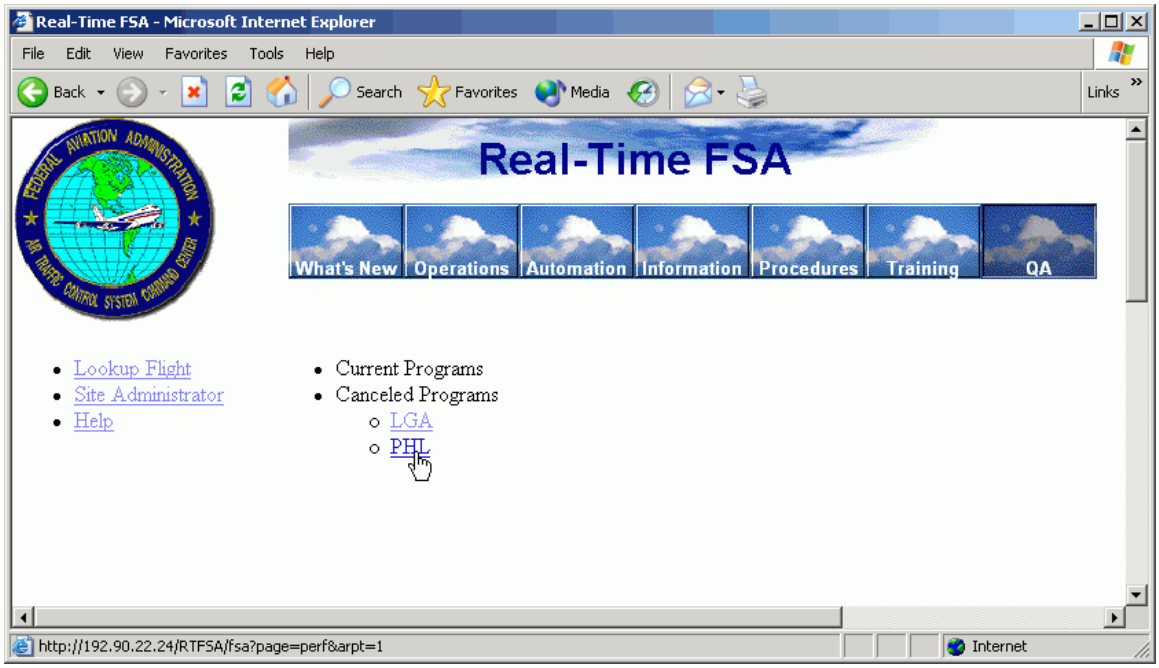

Figure 11-12: FSA Home Page

The FSA home page shown in Figure 11-12 displays a link for each airport that is currently running a GDP. Clicking on an airport link will display the Performance report by default for the selected airport. All other reports can be accessed from links on the Performance report page. Links are also available for canceled GDP's from the current day. The reports for the canceled GDPs are accessed in the same manner.

Note: Real-Time FSA may take up to 20 minutes to reflect a new GDP.

Performance Report

The Performance Report shows whether the program is delivering the requested Program Rate (see Figure 11-13). For each program hour, the report displays the program rate, number of slots, number of cancellations, extra demand, displaced demand, and the total demand expected. These counts are key to understanding why the program is over or under delivering for a particular hour.

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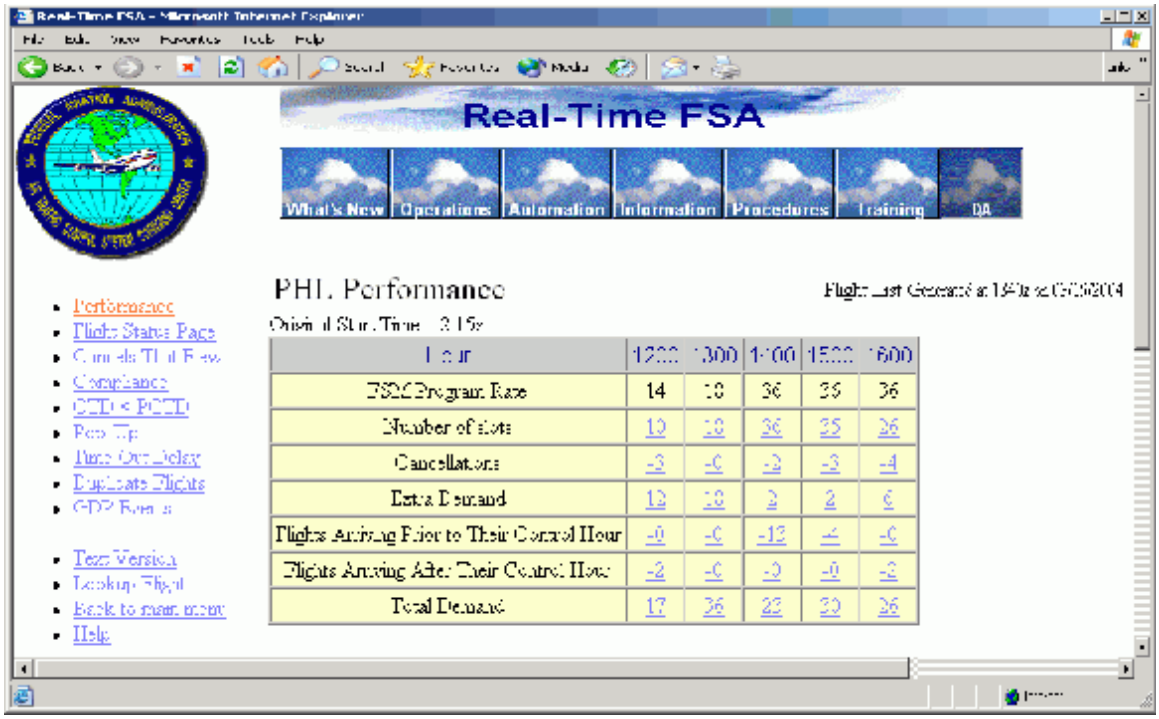

Figure 11-13: PHL Performance Report

Drill Down Capabilities

To view the flights comprising each count click on the associated link. Figure 11-14 shows the result of clicking on the Extra Demand Link for the 1200 hour. The resulting flight list shows all of the aircraft that are expected to arrive in the 1200 hour that do not have FSM assigned slots in this hour.

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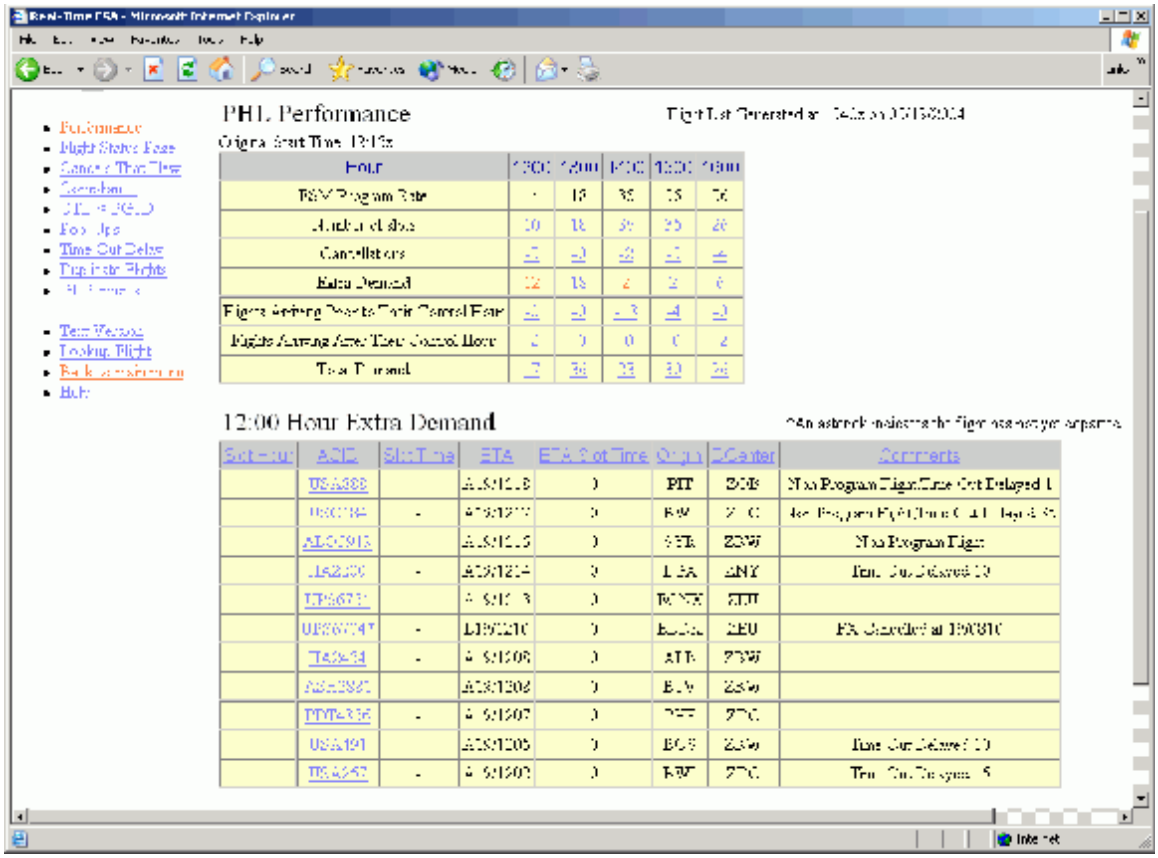

Figure 11-14: Drill Down Extra Demand

The "Comments" column in the flight list provides an indication of why a flight either does not have a slot or is not arriving at its assigned slot time. For instance, N505AM and DAL1492 are pop-ups that have not yet been assigned a slot through a revision. CAA268 was not originally expected to arrive during the hour, however due to an airline delay it is now expected to arrive in the 1400 hour. Notice also that there are several flights that were given slot times in the 1200 and 1300 hours but are actually going to arrive in the 1400 hour because they are departing late due to an airline delay or they are in time-out delay. See Table 1 on page 9 for a complete list of the comments that may appear in the "Comments" field.

Accessing a Flight's History: Clicking on a call sign in the flight list will display all the flight data received through the ADLs for the flight selected.

Sorting: By default the flight lists displayed on the performance page will be sorted by Slot Time. Click on any of the underlined column titles to re-sort the flight list by the column selected.

Performance Report Usage

1. **Determining why there is over or under delivery**

   The counts in combination with the comments in the drill down flight lists show why an hour is heavy or light. For instance, in Figure 3, twenty-two additional flights are expected to arrive in the 1400 that do not have slots in this hour. The comments for these flights reveal that the extra demand is due to pop-ups, flights that were delayed into the

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1400 hour, and flights that departed early. However, two flights that were supposed to arrive in the 1400 hour are no longer expected to arrive in this hour due to non-compliance and errors in ETE estimation. Thus, the net balance (i.e. the total demand) is expected to be 84 flights – twenty flights more than the requested program rate.

2. **Determining if a compression or revision is needed**

The information provided in the Performance Report can be used to determine whether a compression or revision is needed. To determine if any action is needed and what type of action is most appropriate, compare the requested Program Rate to the Num. Of Slots and the Total Demand for future hours, as described below.

- **No Action Required**: If the Total Demand = Program Rate, Cancellations=0, and there has been very little shift in demand, no action should be necessary. The demand graph in FSM will appear "smooth" and the FSM time line will have very few triangles and no squares. Note: The number of “Flights Arriving Before Their Control Hour” and the number of “Flight Arriving After Their Control Hour” show the degree to which demand has shifted.
- **Compression Only**: If the Total Demand <> Program Rate, but the Number of Slots=Program Rate, and there is no pop-up traffic then a compression should suffice. Pop-ups that do not have a slot will be listed at the top of each hour in the Extra Demand flight lists. To view the Extra Demand flight list for an hour, click on the Extra Demand count for that hour. The Pop-Up Report will also show the amount of pop-up traffic expected in each hour.
- **RBS++**: If Total Demand <> Program Rate, and Number of Slots <> Program Rate, or there is a significant amount of pop-up traffic then a revision is needed.

3. **GDP Modeling**

The Performance report will show the impact of GDP actions/modeling choices. For instance, after a ground stop is issued, the number of slots assigned per hour will no longer equal the Program Rate. Issuing a ground stop redistributes the arrival slots based on the ground stop release time - not the Program Rate. Issuing EDCT updates and adjusting GDPs by “Blanket” amounts of time also moves arrival slots and may cause the number of slots to differ from the Program Rate.

The presence of large negative ETE fluctuations (see the comments provided in the flight lists) may indicate a lack of slot availability when a large number of flights are exempted in RBS++. See the Program Events report to determine how many flights were exempted for a particular event. This report displays the total number of flights included in each program event as well as the number of flights affected. The difference between these two numbers equals the number of exempt flights for that event.

4. **Detecting Airborne Holding**

Large positive ETE fluctuations for flights that have already departed may be an indication of airborne holding (see the comments provided in the flight lists).

5. **Gaming**

Large negative ETE fluctuations before departure may be an indication that an airline is manipulating en route times through the substitution process to get an earlier CTD. To

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check for gaming, click on the ACID for the corresponding flight to obtain the flight history. Review the fields “CTA-CTD” and “CTL_Type” for increases in the difference CTA-CTD, due to a substitution. If a flight plan has been filed, compare value for PETE to the difference CTA-CTD resulting from the substitution. The PETE value is listed in the flight history, and it can be found by scrolling to the right. If the PETE value is not approximately equal to the difference CTA-CTD continue to monitor the airline for similar occurrences.

Compliance Report

The compliance flight list shows all flights that did not comply with their assigned controlled time of departure. A flight is considered "non-compliant" if it failed to depart within a specified “compliance window”. The compliance window is the maximum number of minutes a flight may depart prior to its CTD or after its CTD and still be considered compliant. Authorized ATCSCC personnel may change the compliance window through the Site Administration link on the FSA home page. See Appendix C for additional information. By default FSA uses (-5, +15) minute compliance window. This means a flight is considered non-compliant if it departed early by more than 5 minutes, or it departed late by more than 15 minutes. By default the Compliance Flight List is sorted by Departure Hour. Click on any of the underlined column titles to sort by the selected column.

Note: FSA uses the CTD assigned to the flight when it departed to measure compliance. Departure status is determined by looking at the ETD prefix. A prefix of “E" or "A" indicates that flight has departed. The ETD prefix is being used to determine departure status instead of ARTD, in order to capture flights that have departed for which ETMS doesn’t receive ARTDs (i.e. flights which started out VFR).

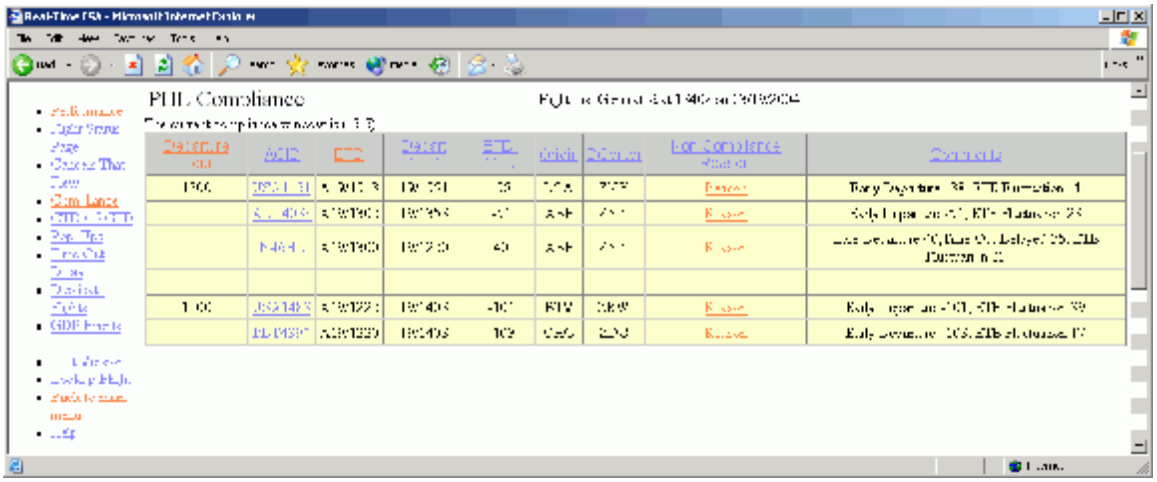

Figure 11-15: Compliance report

Compliance Report Usage

The Compliance Report can be used to identify FAA facilities that are not releasing flights within the compliance window, as well as airlines that fail to depart within the compliance window. Sort by Dcenter to see if the airports within a particular center are releasing flights early or late. A lack of compliance within a particular departure center

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may indicate the center is trying to deal with local traffic management initiatives such as ESP delays or miles-in-trail restrictions. Sorting the Compliance report by ACID can help identify airlines that are consistently departing flights early or late. However, when looking at airline compliance, keep in mind that late departures may be due to departure delays at the origin – not airline delays.

> **Note:** The accuracy of the compliance report can be affected by suspension of EDCTs, "white hat" approvals for which an EDCT update was not submitted, and ground stops that are not implemented using FSM. When any of the preceding events occur, a flight's CTD is not updated in the data; thus, the flight may appear non-compliant.

Pop-up Report

The Pop-Up Report shows all pop-ups arriving (or expected to arrive) during the program hours, as shown in Figure 11-16. For the purposes of this report, a pop-up flight is defined as any flight that does not have a SGTD/SGTA and did not appear in the ADL data at the time the initial program was modeled. This list will show all pop-ups regardless of whether they have subsequently been given a slot in a revision.

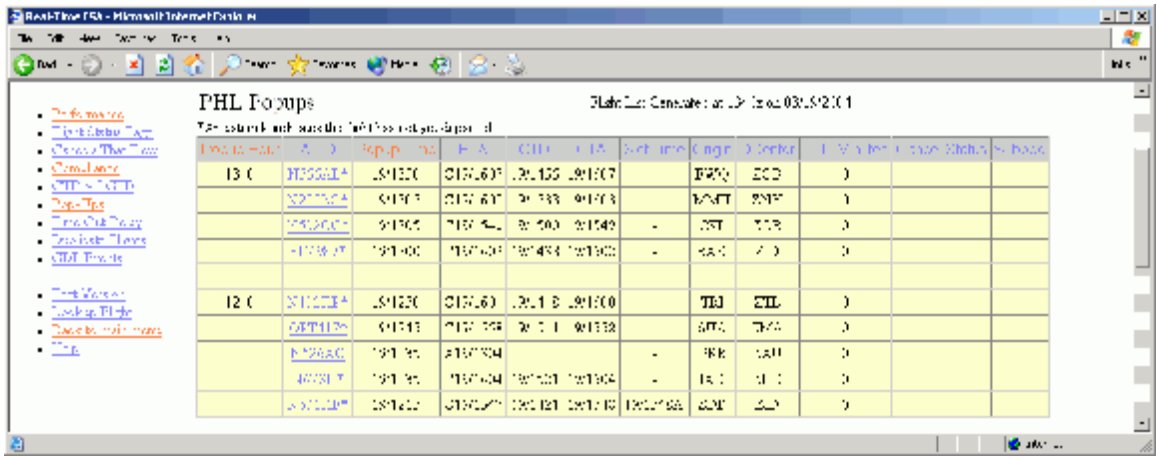

Figure 11-16: Pop-up Report

The Pop-up Time column shows the time the flight first appeared in the ADLs. The TOD column indicates whether the flight is currently in time out delay. The CNX-Status column shows whether the flight has been canceled. If a flight has multiple cancellation flags set, only one cancellation reason will be shown according to the following precedence: UX, FX, TO, RZ, RS, RM. The Subbed column indicates whether the flight has ever been subbed by the airline via a SI message or simplified sub message. By default, the pop-up flight list will be sorted by the Pop-Up Time. Click on any of the underlined column titles to sort by the selected column.

Pop-up Report Usage

The pop-up report shows the unscheduled flights that have been filed since the initial GDP was executed. To see how many pop-ups have been filed since the last revision/extension sort the pop-up list by pop-up time and look for flights whose pop-up time is later than the model time of the revision/extension. Sort the pop-up flight list by

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ETA to determine if the excess demand for a particular time period is due to pop-up traffic.

Sort the pop-up report by ACID to see which carriers are filing pop-up flights. By reviewing the Pop-up report on a consistent basis, it may be possible to identify trends such as whether a carrier tends to operate the pop-ups it files. Review the TOD and Cancel Status columns for pop-up flights that are contributing to the "Rolling Spike Problem" by time out delaying or time out canceling. If a large number of pop-ups are time out canceling, this may indicate there is a problem with duplicate calls signs or that some other automation problem is occurring.

Duplicate Flights Report

The Duplicate Flights Report primarily identifies multiple occurrences of a flight that appear in FSM, due to data processing errors, such as ETMS flight mismatches. However, some shuttle flights may also be flagged as duplicates. The intent of this report is to alert users about flights shown in FSM that **may** not operate. This list might show two flights as duplicates even though they are both legitimate flights, such as the case with shuttle flights. FSA identifies possible duplicates by looking for flights with the same or similar ACID, origin, destination, initial gate time of departure (IGTD), and ETA. The list is sorted by ACID, as shown in Figure 11-17.

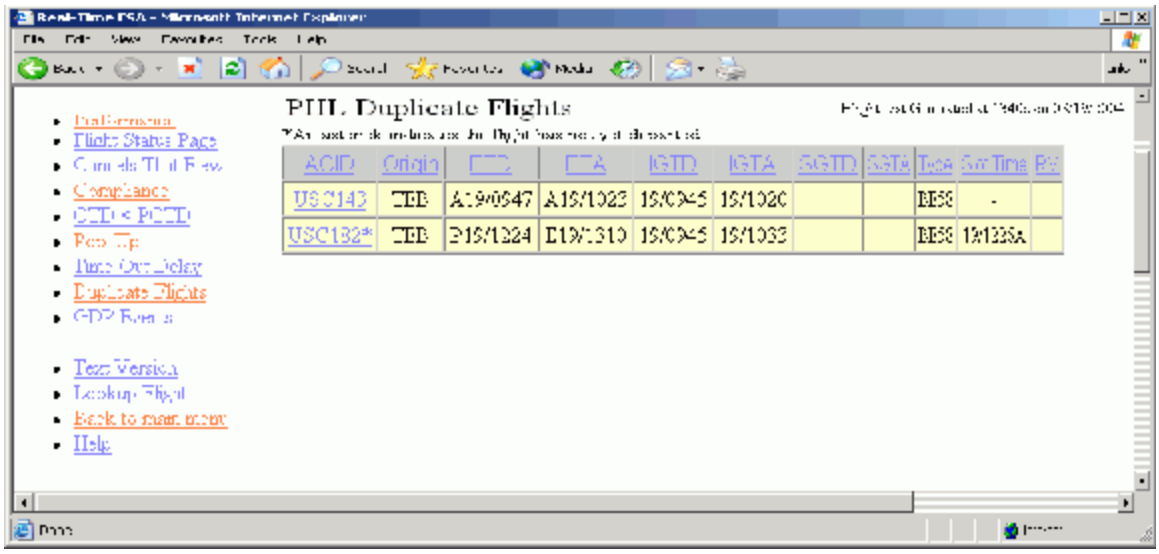

Figure 11-17: Duplicate Flights List

Duplicate Flights Usage

The Duplicate Flight Report allows the user to easily see demand that might not materialize. If it appears that one particular carrier has a large number of flights listed, it could mean that carrier is having a data problem. Like the Time-out Delay report, follow up with a carrier may be needed to determine if a flight is going to operate or not. Looking at the ASLOT field will allow the user to see which flights are included in the program.

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12 Monitoring EDCT Compliance

EDCT compliance impacts the success of a Ground Delay Program. Real-time monitoring of EDCTs is possible through both FSM and Real-Time FSA to identify problem areas as they occur, therefore reducing or eliminating EDCT compliance issues. This chapter introduces several options for monitoring 'estimated departure clearance time' (EDCT) compliance of a Ground Delay Program.

Using FSM to Monitor EDCT Compliance

From the FSM *Control Panel* you can access 5 compliance flight lists:

1. CTA Compliance
2. Actual ETE vs. Original ETE Compliance
3. CTD Compliance
4. Spurious Flight Compliance
5. Cancel That Flew Compliance

In this chapter, we will be focusing on CTD Compliance for monitoring EDCT compliance of a Ground Delay Program. See Chapter 11 for more information on the other 4 compliance reports.

To view a list of flights that had non-complaint EDCTs, select **Reports** > *Compliance* > *CTD Compliance* from the main FSM *Control Panel* component. The *CTD Compliance* list includes all flights included in a delay program that violate departure compliance. The default departure boundaries are:

More than 5 minutes before their EDCT or more than 5 minutes after their EDCT.

Any flight that has an ARTD of 5 minutes earlier or 5 minutes later than the most recent OrigEDCT will be included in the **Reports** > *Compliance* > *CTD Compliance* list. (See Figure 12-1).

> **Note:** Ensure that the airport you wish to view the compliance report for is in focus. If there is no airport in focus, FSM will display an error message indicating that "No current data set" is selected.

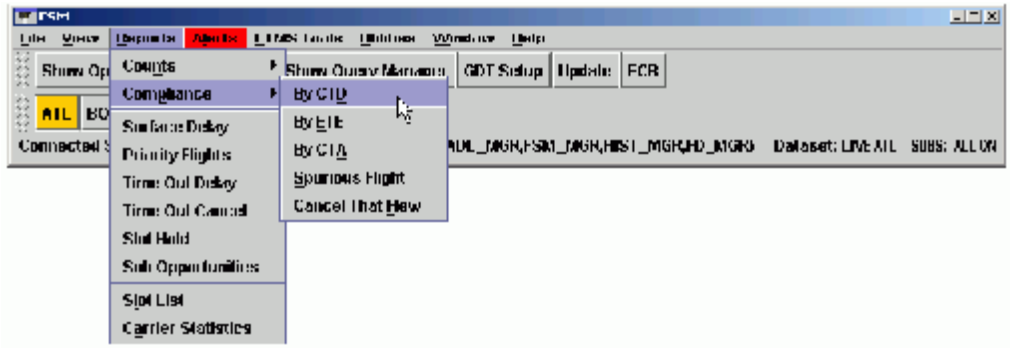

Figure 12-1: Accessing the CTD Compliance List

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When the CTD Compliance list is opened the CTD (or EDCT) field is ***not*** displayed by default. The flights ACID, the ETD, and ETA are displayed by default. The ETD has a prefix "A", which indicates that the flights' ETD is the Actual time of departure. (see Figure 12-2). The total count of all CTD non-compliant flights is displayed in the lower left-hand portion of the CTD Compliance window. The CTD Compliance window will automatically update when FSM receives the next ADL.

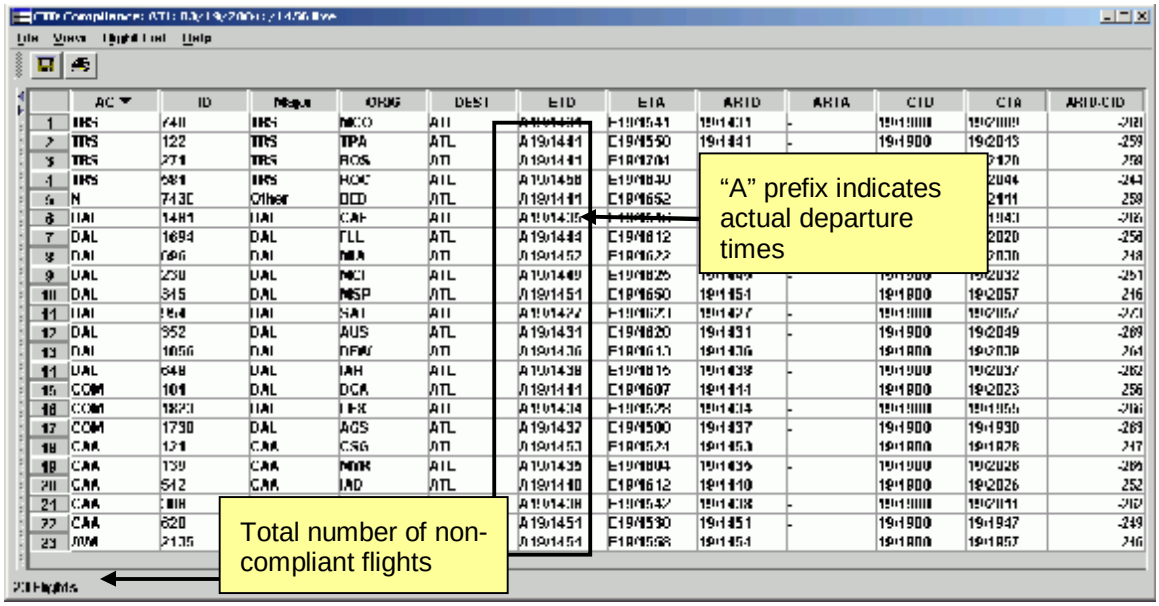

Figure 12-2: CTD Compliance Window

Viewing a Single Flight

There are two ways to access more information on a single flight from the CTD Compliance window. You can right-click on a single flight or use the **View** menu option. Right-click on a flight and select either *View Flight Info* or *View Flight details* for more information on the Flight (see Figure 12-3) or click on a single flight to highlight the entire row and then select **File** > *Flight Info* or *Flight Details* to access the same information.

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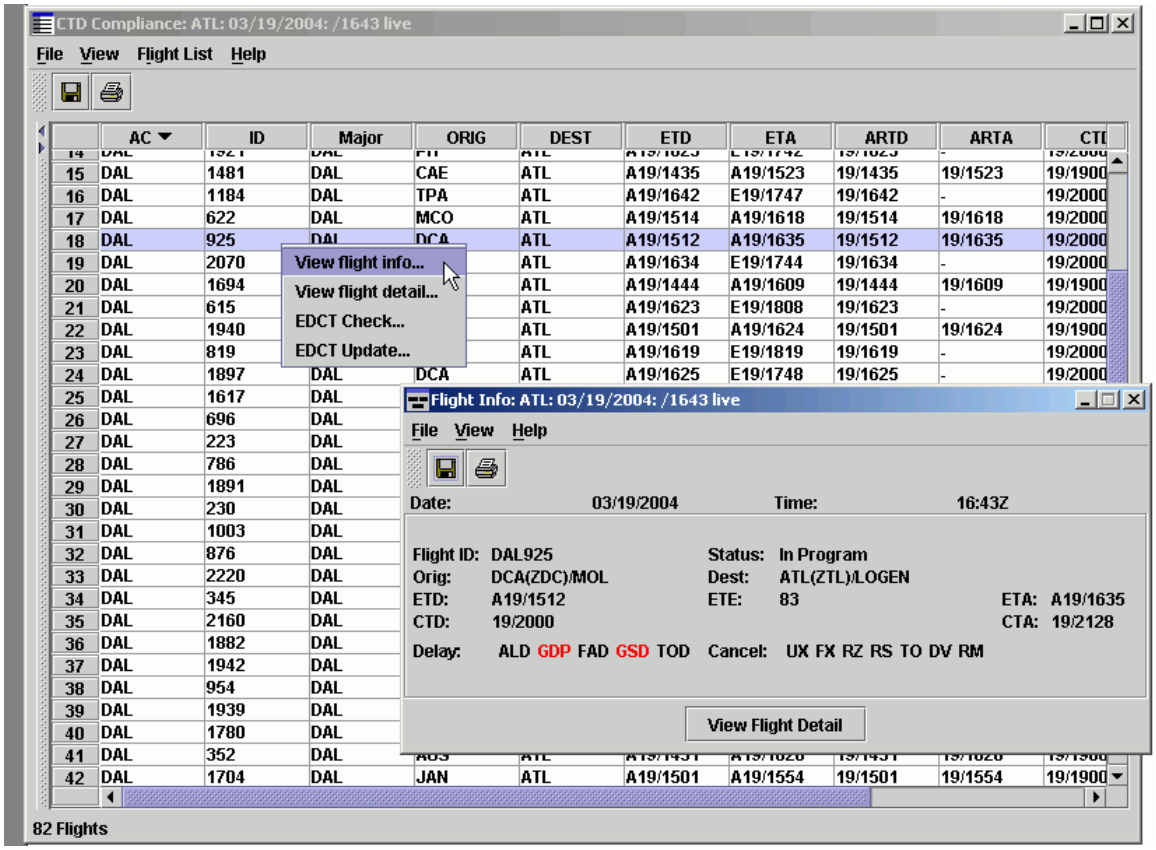

Figure 12-3: Accessing Flight Information

Adding ADL Fields

To add more ADL fields select **View** > *Columns* from the CTD Compliance window to display the Columns setting window. All the ADL fields available are located in the Available scroll box on the left and the ADL fields (columns) that are currently displayed on the CTD Compliance window are located in the Shown scroll box to the right. Locate the ADL you wish to add to the CTD compliance window using the scroll bars, then either double click on the ADL field or click once to highlight it and then click the right arrow to move this field to the Shown box. After an ADL is moved from the Available box to the Shown box, the ADL field will no longer be displayed in the Available box. To remove a particular ADL field from the Shown box, perform the same operation in reverse to move it back to the Available box. Figure 12-4 shows how CTD was moved from the Available box to the Shown box.

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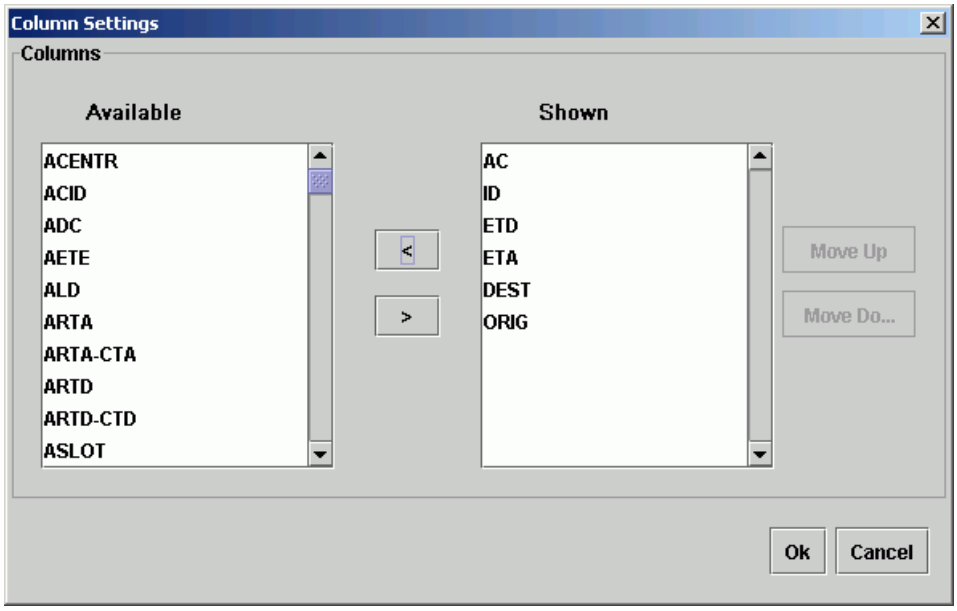

Figure 12-4: Column Settings Window

Column Positioning

There are two different ways to arrange the order of how the columns are displayed. The easiest and most convenient method is to drag and drop the column head to the desired position in the List directly from the CTD compliance window. The second method is to move the column positions from the Columns Settings window by selecting the ADL data field (column head) from the Shown box and moving it up or down the list using the **Move Up** or **Move Down** buttons.

Sorting Information in the CTD Compliance List

You can also sort and arrange the CTD Compliance window, as well as any other flight list, according to your own needs. Sort the list by one column category at a time by double clicking the column heading. The arrow at the top of the column indicates that the list is sorted by ascending or descending order for that field. To sort by multiple categories, select **View** > *Sort* on the *CTD Compliance* menu. The **Sort** window displays the data fields that are currently listed in the Flight List. These data fields correspond to the available data fields in the ADL.

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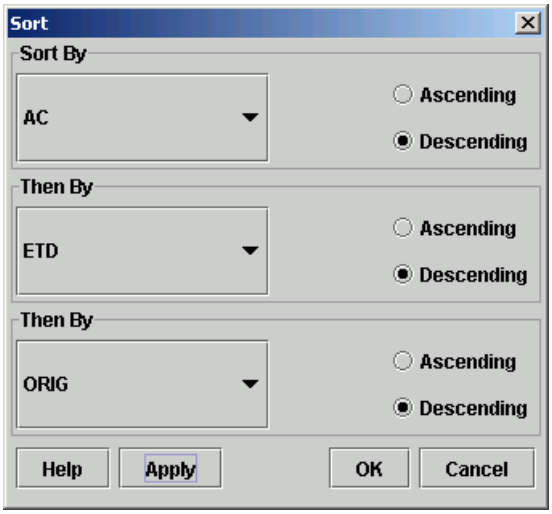

Figure 12-5: Sort Window

Multi-level Sorting

From the **Sort** window, select a data field in the *Sort By* drop-down window and check either the Ascending or Descending radio button (see Figure 12-5). Select a data field in the *Then By* drop-down window and check either the Ascending or Descending radio button in the reverse order in which you want to sort. For example, if you wanted to sort your Flight List by ACID, ETD, and CTD respectively, you would make the following drop-down selections in the Sort Component:

1. Select **ACID** data field title and chose the Descending radio button.
2. Select **ETD** data field title and chose the Descending radio button..
3. Select **CTD** data field title and chose the Descending radio button.

Select **OK** or **Apply** in the *Sort* window and the CTD Compliance list will sort flights according to your parameters.

Sort Window Buttons

1. **Help** - The **Help** button displays information about the component version currently running in the Sort window.
2. **Apply** - The **Apply** button keeps the Sort window open after the flight list has been updated.
3. **OK** - The **OK** button closes the Sort window after the flight list has been updated.
4. **Cancel** - The **Cancel** button cancels any selections made and closes the Sort window.

Figure 12-6 shows flights sorted by ACID, then ETD, then CTD. This sorted list corresponds with the Sort window parameters shown in Figure 12-5.

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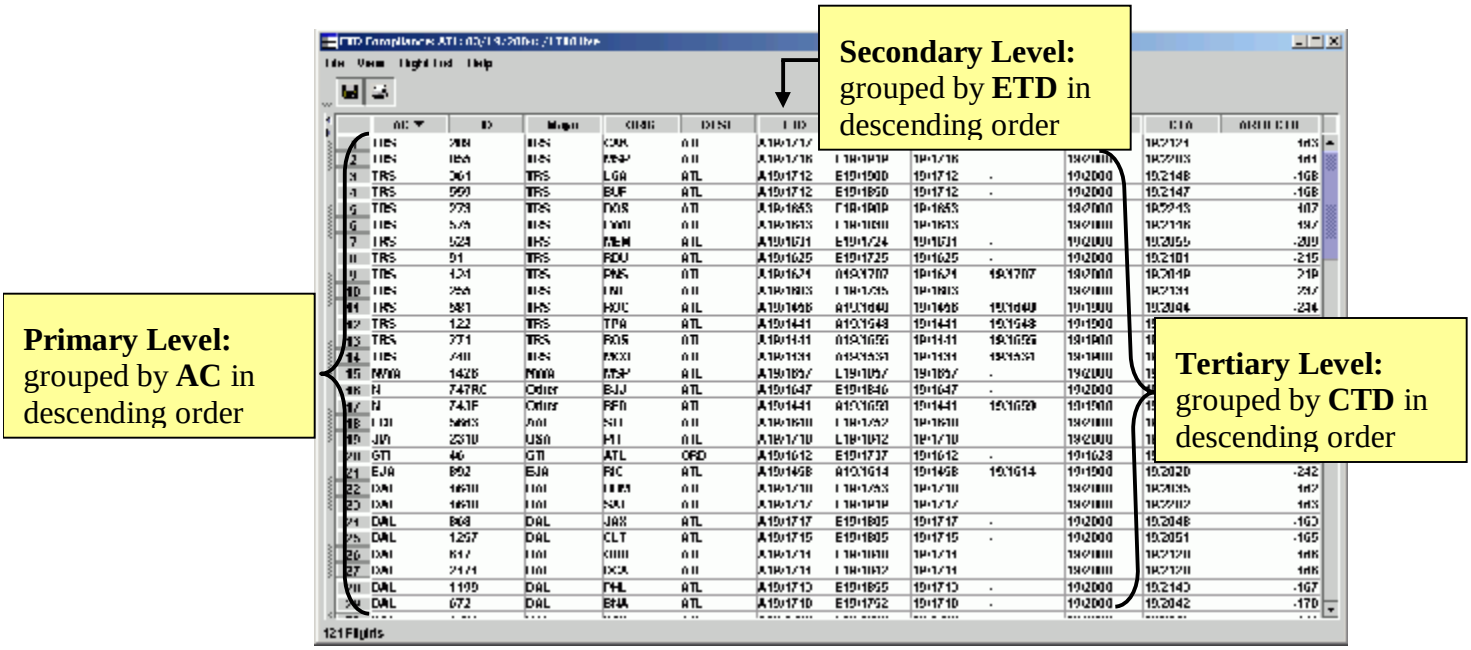

Figure 12-6: Sorted CTD Compliance List

Compliance List Menu

The menu bar in the Flight List component contains four options: **File, View, Flight List** and **Help.** The functionality of compliance flight lists is identical to all other FSM Flight Lists.

1. **File Menu**

File > *Save as* - Saves the *Compliance* List to a text file, which can be opened later and used again.

File > *Print* – Prints the *Compliance* List information viewed on the monitor screen.

File > *Close* - Closes the *Compliance* list window.

2. **View Menu**

View > *Rename window*– Displays the Rename Window dialog box and allows you to change the title bar name.

View > *Select Data Columns* **-** Allows you to add or delete ADL data fields to the Flight List.

View > *Group Flights* **-** Allows you to group ADL data fields to the Flight List in ascending or descending order.

View > *Sort Flights* **-** Allows you to sort ADL data fields to the Flight List in ascending or descending order.

View > *Apply Filter* or Ctrl + A – Allows the user to apply a filter to the data fields in the Flight List

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View > *Clear Filter* or Ctrl + L – Allows the user to clear a filter from the data fields in the Flight

View > *Flight Info* - Opens the *Flight Info* window.

View > *Flight Detail* - Opens the *Flight Detail* window.

3. **Flight List Menu**

Flight List > *Set Time* or CNTL + T – Sets the time for the *Flight List* component in Historical mode only

Flight List > *Search by Call sign* or Ctrl + F – Opens the *Search by Call sign* window.

4. **Help Menu**

Help > *CTD Compliance* – Accesses the web-based on-line help for CTD Compliance.

Confirming an EDCT

The **ETMS Tools** > *EDCT Commands* > *EDCT Check* option is available from the main *Control Panel* and will display an unfilled *EDCT Check* dialog box. To confirm a flight's EDCT type in the flight's call sign, its Origin and Destination Airport, and then click **Send**. In addition to using the ETMS Tools menu, right-clicking on a single flight icon in the *Time Line* or flight row in any FSM Flight List window will open a pop-up window that allows you to select *EDCT Check* to display the *EDCT Check* dialog box. The right-click method automatically populates the flight information (see Figure 12-7). Click the **Send** button to submit the request to ETMS. ETMS will then send a response with the flight's current EDCT.

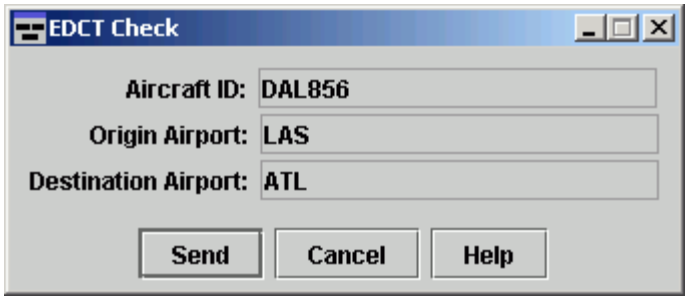

Figure 12-7: EDCT Check Dialog Box

Adjusting an EDCT

An ATCSCC specialist using **ETMS Tools** > *EDCT Command* > *EDCT Check* option from the main Control Panel can adjust the control times for individual flights. This command will display an unfilled *EDCT Update* dialog box. You must type in the flight's call sign, Origin and Destination Airport, IGTD, and updated control times. Updating EDCTs can also be performed through the ECR component, see Chapter 13 for more details. In addition to using the **ETMS Tools** menu, right-clicking on a single flight in

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the *Time Line* or *Flight List* window displays a pop-up window that allows you to select *EDCT Update* to open the *EDCT Update* dialog box. The right-click method automatically populates the flight's information, only requiring you to fill in the new control times for the flight (see Figure 12-8). Click the **Send** button to submit the update to ETMS. ETMS will then send a response confirming the fight's new EDCT, which will reflect in the next ADL.

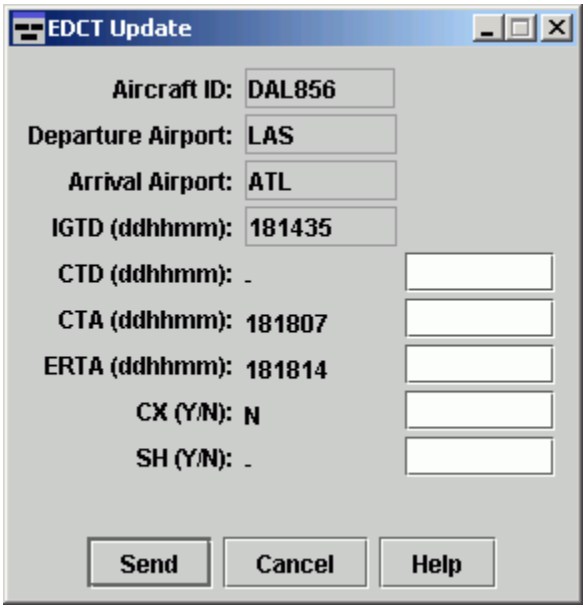

Figure 12-8: EDCT Update Dialog Box

Using Real-Time FSA to Monitor EDCT Compliance

You can use Real-Time FSA (RT FSA) to monitor EDCT Compliance during a Ground Delay Program. To view the RT FSA Compliance report, select the FSA link from of the ATCSCC OIS web page menu. From the RT FSA main page click on the link for the airport of interest, which will display the Performance Report for the selected airport. The Performance report shows if a program is delivering the requested Program Rate. This report helps to reveal the extent at which compliance and data quality impacts the program delivery. All other reports are listed in the menu on the left of the page (see Figure 12-9). Previously canceled GDP links for the current day are also available on the FSA home page. You can access these reports in the same manner as current GDP reports.

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Figure 12-9: RT FSA Performance Report

From the airports Performance page, click on the Compliance link in the menu on the left of the page. This will display the Compliance report for the selected airport. By default, non-compliant flights are sorted by departure hour. The RT FSA Compliance report displays all flights that did not comply with their controlled time of departure (CTD). A flight is considered "non-compliant" if it failed to depart within a specified "compliance window". The compliance window is the maximum number of minutes a flight may depart prior to its CTD or after its CTD and still be considered compliant. Authorized ATCSCC personnel can change the compliance window through the Site Administration link on the FSA home page. By default FSA uses (-5, +5) minute compliance window. This means a flight is considered non-compliant if it departs more than 5 minutes early or departs more than 5 minutes late. You can sort any list in RT FSA by clicking on an underlined column heading.

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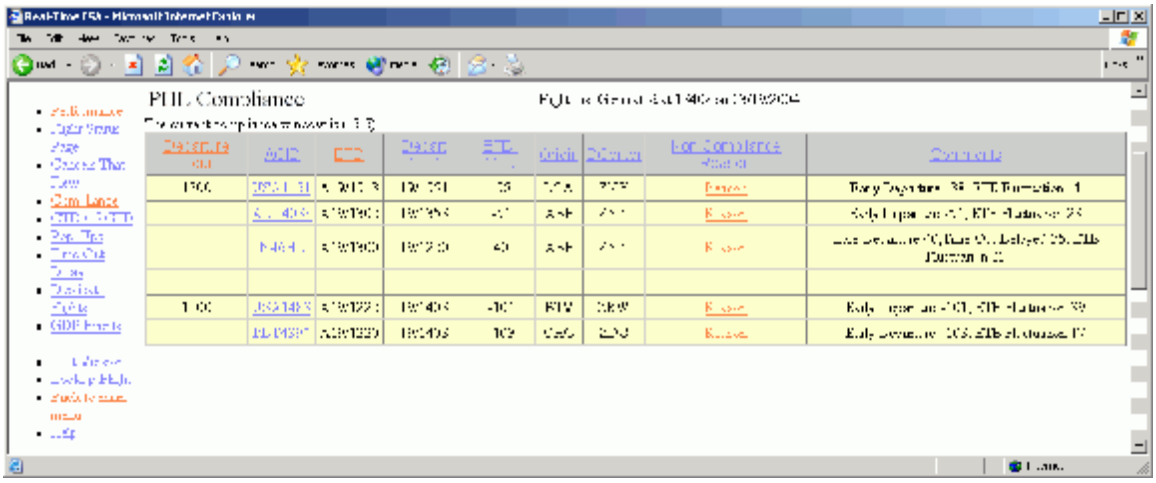

Figure 12-10: RT FSA Compliance Report

FSA Compliance Report Exclusions

Flights with estimated departure times (a NAS DZ message was not received for the flight when it departed) are excluded from the compliance report, due to possible inaccuracies of the estimated time of departure. "Cancels that Flew" and flights for which FSA has detected a "data anomaly" will not show up in the Compliance report. In addition, Ground Stopped flights that departed prior to receiving a GDP control time as well as international flights will be excluded from the report. Non-compliant flights whose CTD is earlier than the airline's filed gated time of departure (PGTD) will be displayed on the CTD < PGTD report and excluded from the Compliance Report.

> **Note:** FSA uses the CTD assigned to the flight when it departed to measure compliance. FSA will only list a non-compliant flight in the compliance report if a NAS DZ (departure message) was received for the flight.

Airline/General Aviation Use of RT FSA

Airlines should review the Compliance report periodically to see if any of their flights appear on this list. Sort the list by carrier clicking on the 'ACID' header. Identification of non-compliance due to airline delay or communication problems will improve the performance of the GDP. When time is available, investigate the origin of the non-compliance to prevent future non-compliance. If there are a large number of non-compliant flights, look for a common problem:

- Look to see if the majority of the flights are consistently departing early or late from the same center or airport. A lack of compliance within a particular departure center may indicate the center is trying to deal with local traffic management initiatives such as ESP delays or miles-in-trail restrictions.
- Investigate to see if there is a data or communications problem that may be affecting a number of flights' compliance.

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- Review all the events affecting the flights. The accuracy of the compliance report may be affected by suspension of EDCTs, “white hat” approvals for which an EDCT update was not submitted, and ground stops that are not implemented using FSM. When any of the preceding events occur, a flight’s CTD is not updated in the data; thus, the flight may appear non-compliant.

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13 EDCT Change Request (ECR)

EDCT Change Request (ECR) tool is being used in the FAA's Collaborative Decision Making Ground Delay Program Enhancements effort. ECR has been operational at the FAA's Air Traffic Control System Command Center since April 2002. Using real-time data culled from CDM participants and aggregated by Hub site, ECR displays current flight information and allows user to change Estimated Departure Clearance Times (EDCTs) for Ground Delay Program controlled flights and keep traffic flowing as smoothly as possible.

Prior to the ETMS 7.8 release, only the ATCSCC had access to ECR. With the release of 7.8, ECR is now available for all CDM participants, although non-ATCSCC user functionality is limited to the use of the SCS request option. Unlimited, Limited, and Manual EDCT UPDATE selections are only available for ATCSCC users and will be grayed out for all other users.

The ECR component allows the user to search for a flight, view current flight information, model suggested update times for flights, and display user options for updating control times. The ECR title bar displays the Airport, date, ADL time, and monitor mode (see Figure 13-1).

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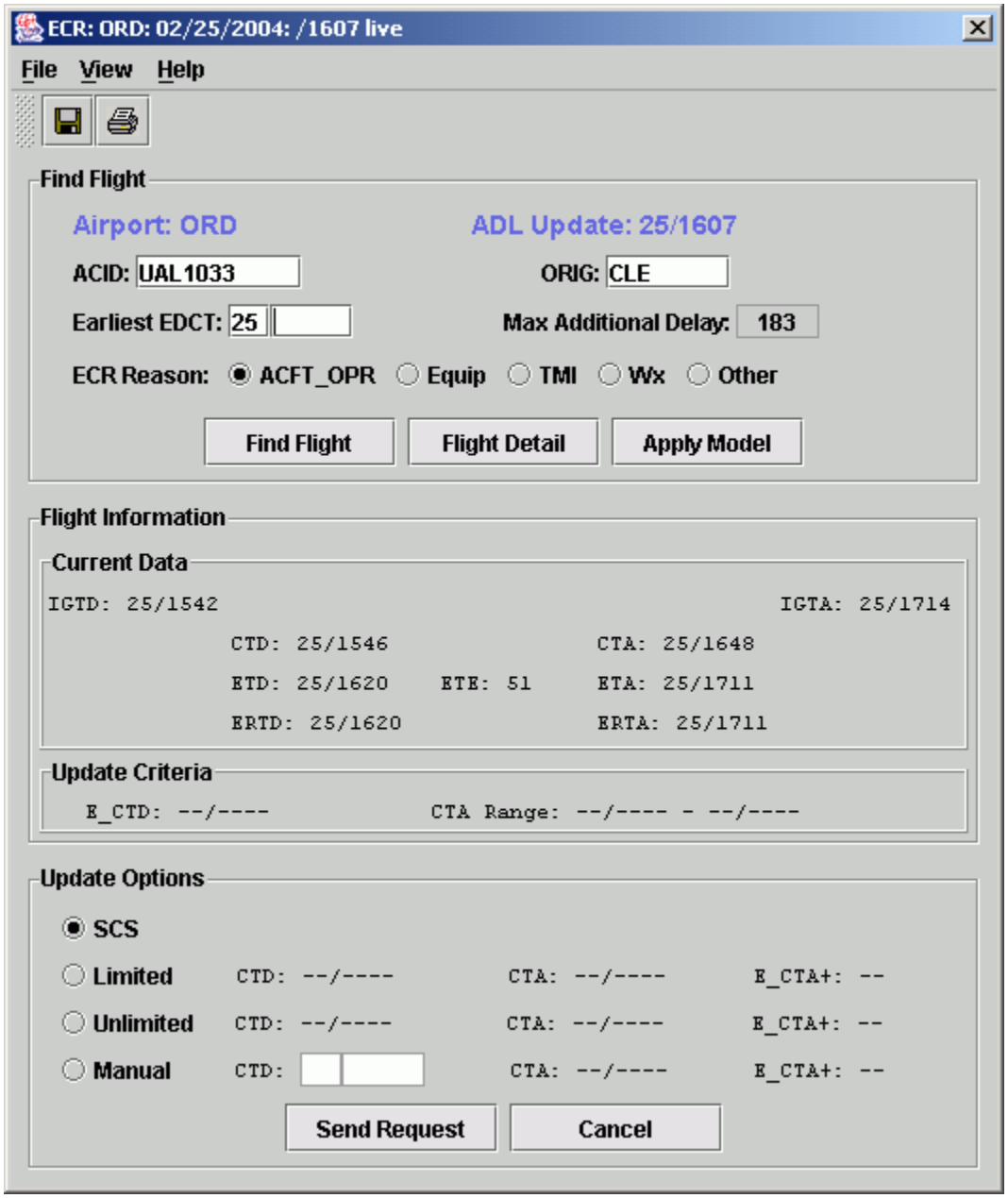

Figure 13-1: ECR Component

ECR Menu Bar

The *ECR* menu bar contains three options: **File, View,** and **Help.**

1. **File** menu:

File > *Close* - Closes the *ECR* component.

2. **View** menu:

View > *Rename Window* – Displays the Rename Window dialog box that allows you to change the component name of the title bar. Enter the desired component

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name then press **OK** to change the title bar heading. Press **Cancel** to close the Rename Window dialog box without making any changes.

3. **Help** menu:

Help > *ECR* - Accesses the web-based on-line help for the *ECR* component.

Opening ECR

There are three methods to open ECR, namely two menu options from the Control Panel and the third option from the Time Line.

1. Click the ECR button from the Control Panel. Ensure that the correct Dataset is active before opening ECR. For example Figure 13-2 displays the ECR component being opened for ATL.

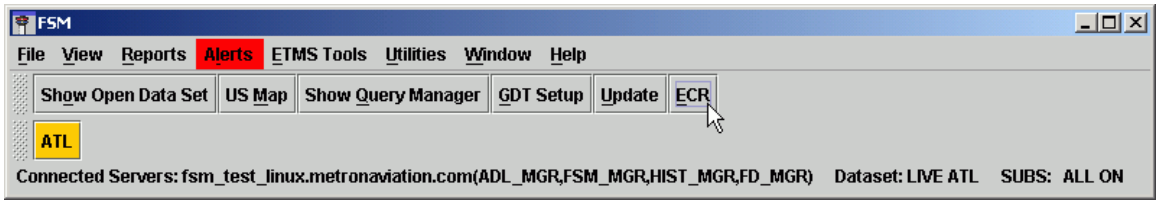

Figure 13-2: Opening ECR from the Control Panel

2. Select **Utilities** > *ECR* from the Control Panel.

3. Right-click on a flight icon in the Time Line and select **ECR** from the popup menu (see Figure 13-3). The ACID, ORIG, and flight information will automatically display in the *ECR* component when opened from the Time Line.

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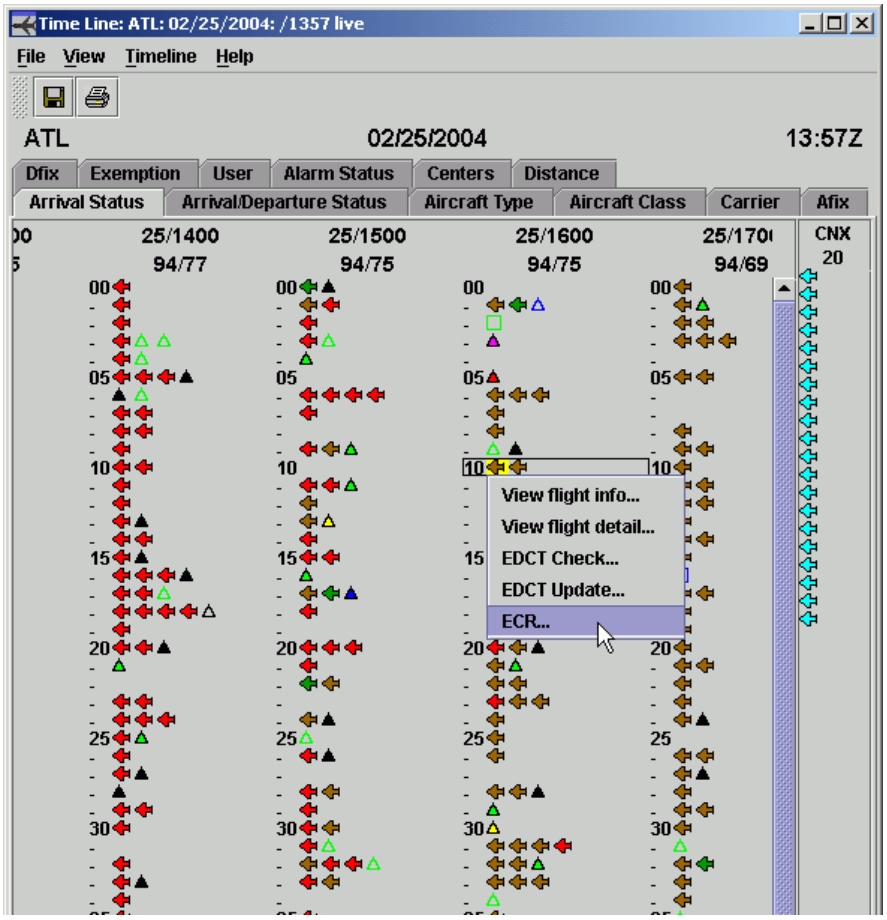

Figure 13-3: Opening ECR from the Time Line

Locating a Flight

To begin updating an EDCT, you must enter a flight in the ECR window. Verify that both the three-letter airport identifier (**Airport**) and the last ADL Update time (**ADL Update**) for the correct airport are displayed in purple text, as shown in Figure 13-4.

1. Open ECR from the Time Line and ECR will automatically Find Flight information and populate the appropriate ECR fields.
2. Manually enter a flight's aircraft identifier in the ACID Field provided and press **Find Flight**.

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Figure 13-4: Updating an EDCT using ECR

Viewing Flight Information

After a flight has been found, the current information is displayed under the Flight Information section.

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Current Data

IGTD	Initial gate time of departure	**IGTA**	Initial gate time of arrival
CTD	Current control time of departure	**CTA**	Current control time of arrival
ETD	Estimated time of departure	**ETA**	Estimated time of arrival
		ETE	Estimated time en route
ERTD	Earliest runway time of departure	**ERTA**	Earliest runway time of arrival

Updating an EDCT for a Flight

After finding and displaying the flight's current information, enter the flight's new **Earliest EDCT** in the Find Flight section of ECR.

1. Type the earliest EDCT to which the flight can comply in the **Earliest EDCT** field.
2. Select one of the five options listed in ECR Reason as the general reason for the EDCT update; either:
   - **ACFT_OPR**: aircraft operator; default selection
   - **Equip**: equipment
   - **TMI**: traffic management initiative
   - **Wx**: weather change
   - **Other:** Reason not previously listed
3. Click **Apply Model** button to populate the Update Criteria section and to model different update parameters based on the new Earliest EDCT data.

Update Criteria

E_CTD	New earliest CTD requested	**CTA Range**	Interval between the New Earliest CTA and the sum of the New Earliest CTA and Maximum Additional Delay

4. Select the desired update option (SCS Request, Unlimited, Limited, or Manual). The SCS radio button option is selected by default (customers other than the ATCSCC will only have the SCS request as an option).
5. Click **Send Request** button to send the request to the Hub site (see **Error! Reference source not found.**).

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Figure 13-5: EDCT Update

Update Options

There are four options for updating an EDCT using ECR: SCS Request, Unlimited, Limited, and Manual. Only the SCS Request option is available for all users. The Unlimited, Limited, and Manual options are for ATCSCC use only.

- **SCS Request:** The ECR tool sends a Slot Credit Substitution (SCS) request via a Simplified Subs Packet to ETMS, using the window reflected in the CTA range. SCS allows the assignment of a slot to a flight when the user does not own a slot at that time to sub the flight into. The SCS Request option is selected by default.

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Note: SCS can only be used when a later EDCT is requested. If the New Earliest EDCT is before the current CTD, the SCS radio button will be grayed out.

- **Unlimited**: The ECR tool shows the EDCT, CTA, and the delay past the New Earliest CTA for the optimal EDCT update for between the New Earliest CTA and the last CTA of the program (ATCSCC Use only).
- **Limited:** The ECR tool shows the EDCT, CTA and delay past the New Earliest CTA for the optimal EDCT update within the CTA range (ATCSCC Use only).
- **Manual**: The user can input an EDCT in the space provided (DD/ hhmm) and the ECR tool calculates the CTA by adding the flight's ETE (ATCSCC Use only).

Viewing SCS Response

After requesting a Slot Credit Substitution (SCS), a response will be sent back from the Hub site. If the SCS request was successful, the response is a slot list of the flight affected (See Figure 13-6), including new control times and control types.

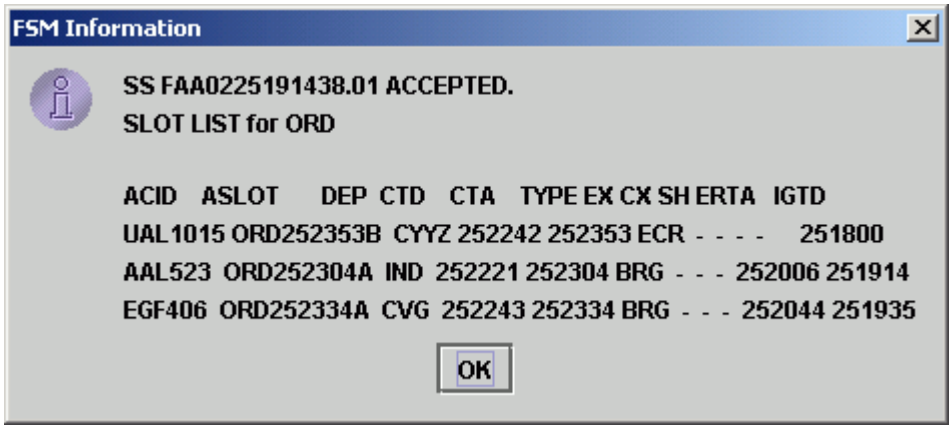

Figure 13-6: SCS Response

Control Types Associated with ECR

Control Type	Control Time Change Origin
ECR	SCS Request submitted by the ATCSCC
SCS	SCS Request submitted by all customers other than ATCSCC (airline user or general aviation customers)
UPD	ATCSCC EDCT update (Changes made by Unlimited, Limited, or Manual options)
BRG	Bridged up to accommodate an SCS request

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14 Revising/Extending a Ground Delay Program

Once a Ground Delay Program is already in place, the conditions that originally necessitated the Ground Delay Program may change. The weather may improve or get worse, a runway may shut down or its' configuration change, the AAR may have increased or decreased, or the demand may also have changed since the original program was issued. When these cases arise, you may find it necessary to revise the original program.

Getting Current Demand and Weather Information

Before you revise, you want to make sure you have the most current ADL. From the FSM *Control Panel* component, select **ETMS Tools** > *ADL Request*. Enter the three-character airport ID in the **ETMS ADL Request** Dialog box and press **Send**, as shown in Figure 14-1. The request is sent immediately to ETMS and all live mode windows for that airport will update when the new ADL is received.

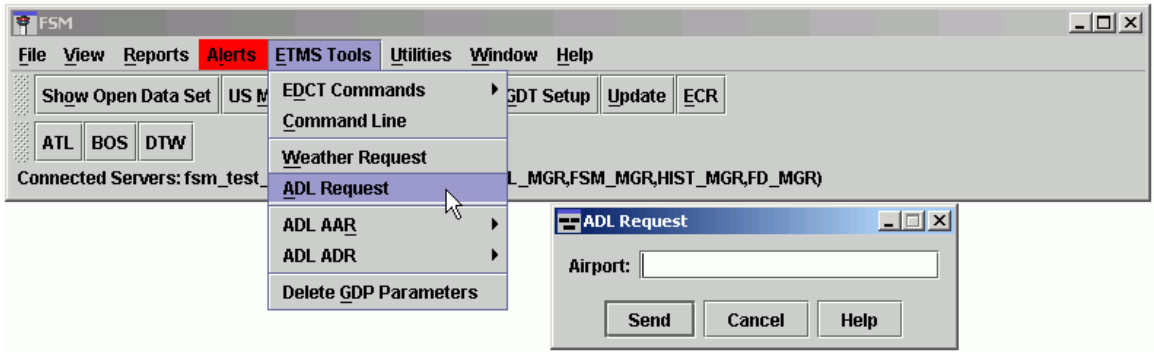

Figure 14-1: ETMS ADL Request and ETMS ADL Request Dialog Box

You will also want to make sure you have the most recent weather information. Select **ETMS Tools** > *Weather Request* from the FSM *Control Panel*. ETMS Weather is the option directly above the ADL Request (see Figure 14-1). Enter the three-character airport ID in the ETMS Weather Dialog box (see Figure 14-2). The request is sent immediately to ETMS and the current METAR and TAF are displayed in a text window on your screen.

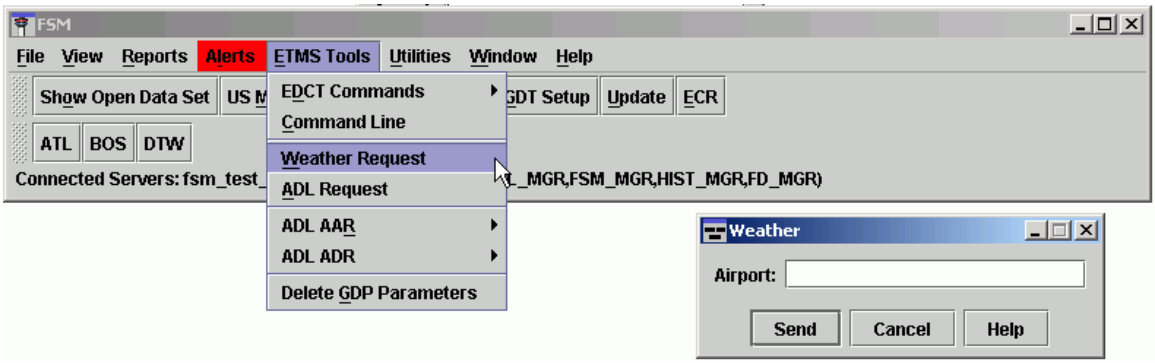

Figure 14-2: ETMS ADL Request and ETMS ADL Request Dialog Box

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Deciding When to Revise a Program

There are several tools available to help you decide if a revision is necessary. The Live *Time Line* and *Bar Gr*aph components allow you to visually compare the airports capacity (AAR) vs. its demand. If the *Time Line* shows a large number of delayed flights (solid triangles) or canceled flights (solid squares) and/or the *Bar Graph* shows that demand is under or over the AAR for certain hours, a revision will help to reallocate the slots. When a revision is necessary, the FSM Power Run Tab in the GDT *Setup* component is helpful to analyze different options. (See Chapter 9 for more information on how to use Power Run). In addition to FSM, Real Time Flight Schedule Analyzer (RT-FSA) displays the differences in demand and slots from the performance report, as shown in Figure 14-3. Check the Number of Slots and compare that number to the total demand. Pop-up flights that do not have a slot will be listed at the top of each hour in the Extra Demand flight list. To view the extra demand list for an hour, click on the Extra Demand count for that hour.

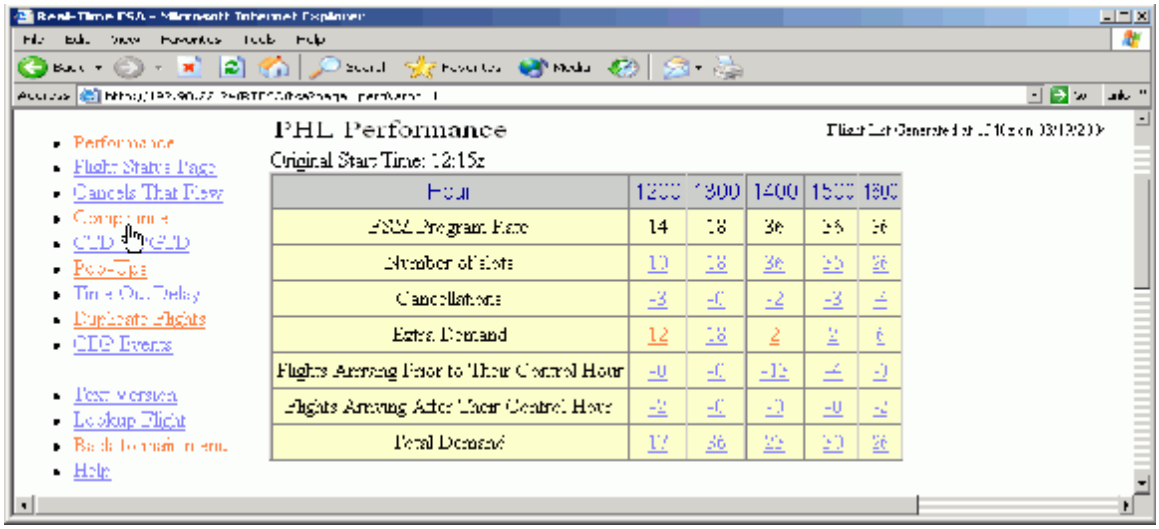

Figure 14-3: RT FSA Performance Report

Revising a GDP

A number of parameters can be changed during a revision to meet the change of conditions at the airport being monitored. For example, any one or combination of the following parameters may need to be revised: the AAR may need to be increased/decreased, the number of centers involved may be increased/decreased, the distance range of the GDP may be expanded/reduced, or the length of the program may need to be extended. To change any of the program parameters, open the airport in GDT mode. The current parameters will "auto fill" in the GDT *Setup* component. Ensure that when issuing a revision that the **Initial GDP** checkbox is unchecked and the **Last Revision End time** is populated on the General Tab.

Modifying the AAR

Click on the AAR Tab in the GDT *Setup* component. The current AAR will be displayed for the hours of the current program. To increase/decrease the AAR, use either the **Fill**

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method or change each hour manually. To review the AAR Tab, see Chapter 9 GDT *Setup* AAR Tab.

Reducing/Expanding the Scope

Reducing or expanding the scope can be done with Tier and Distance based GDPs. Click on the Tier/Dist Tab, and select either **Exempt By** *Tier* or *Distance*. If you prefer to use the Tier based GDP, you can select a new center group or manually add or delete centers by selecting the center checkboxes. Newly selected centers will now be included (will receive delay) in the program. If a center is released from program delay, the flight originating from that center will be run through the release delay algorithm. Distance based programs are adjusted based on the distance radius. You can expand the distance range to capture more airports in the program or decrease the distance radius to release delay on previously delayed airports.

Extending the Program

To extend the program, change the **Duration** time from the General Tab of the GDT *Setup* or click and drag the **End Time** slide bar to adjust the duration. You can extend the program without changing any other parameters or you can extend the program in conjunction with any other number of parameter modifications, as shown in Figure 14-4.

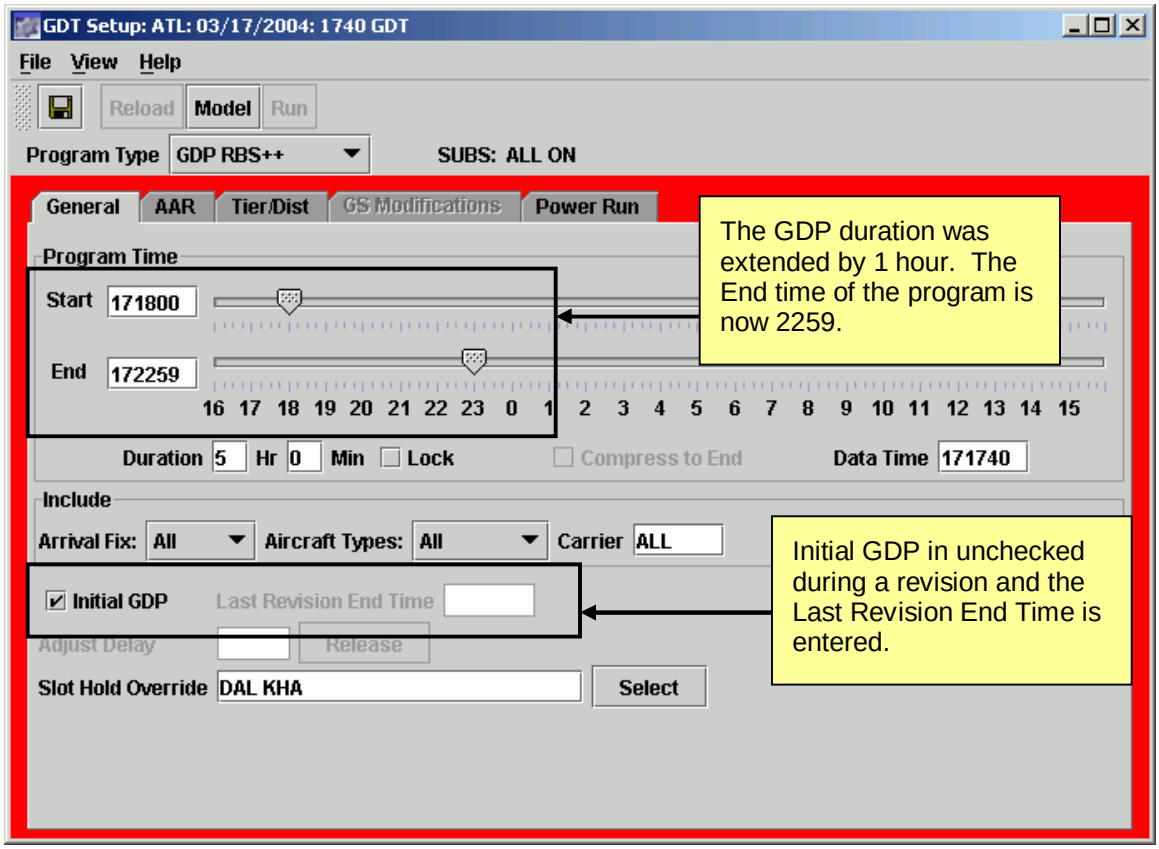

Figure 14-4: Modifying the Program Duration

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Sending a Proposed Parameters Advisory

After modifying the parameters of the GDP and if the modeled results are favorable, it is recommended to send out a Proposed Advisory. A Proposed GDP revision is a program being suggested by the FAA, but not immediately implemented. Press **Run** from the GDT *Setup* Panel to open the GDP Coversheet. Review the parameters and then press **Advisory**. Fill out the Advisory window Remarks section and make sure that the **Proposed** radio button is selected (See Figure 14-5). Press **Send** to distribute the proposed parameters to all FSM users. A Proposed GDP revision allows NAS users enough time to comment on the proposed parameters even though they may change before an actual program is implemented.

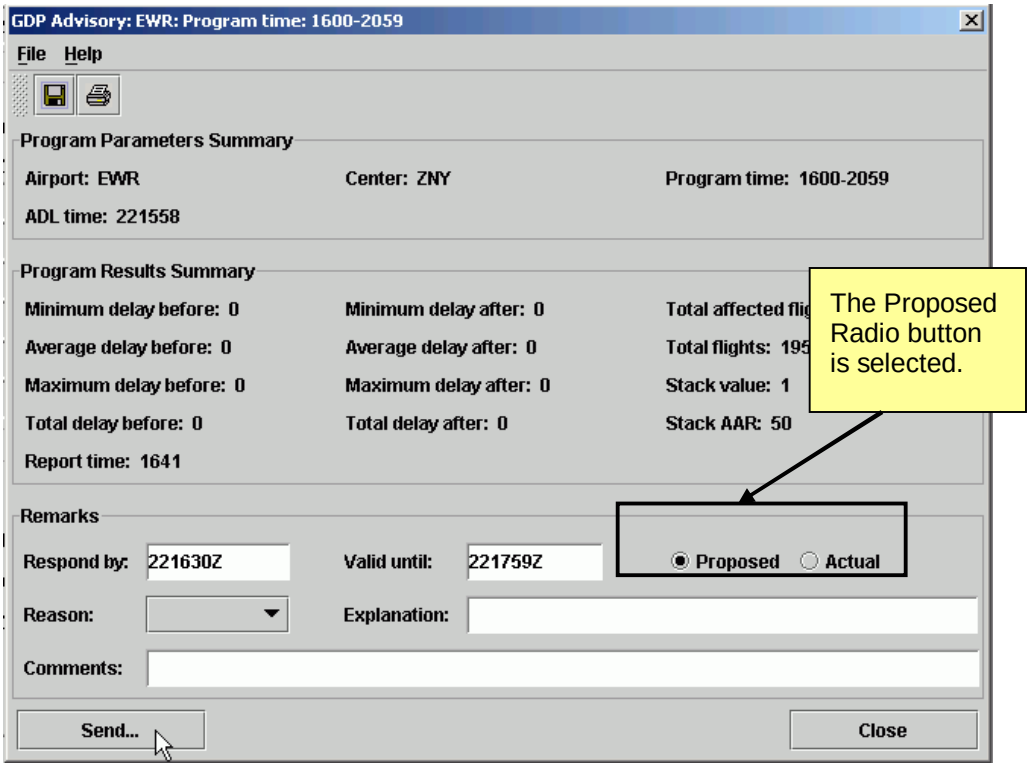

Figure 14-5: GDP Advisory Window

Suspend Airline Substitutions and Slot Credit Substitutions

Now you are ready to issue the revised GDP but before issuing the revision, the acceptance of airline substitutions and Slot Credit Substitutions (SCS) messages needs to be temporarily suspended. From the FSM Control Panel, select the **ETMS Tools >** *ECDT Commands* > *EDCT Sub Off* option to turn substitutions off, as shown in Figure 14-6. Enter the three-character airport ID into the EDCT SubOff dialog box and press **Send** to suspend substitutions for that airport. Airlines substitution or SCS messages will no longer be accepted after the SubOff message is sent to ETMS.

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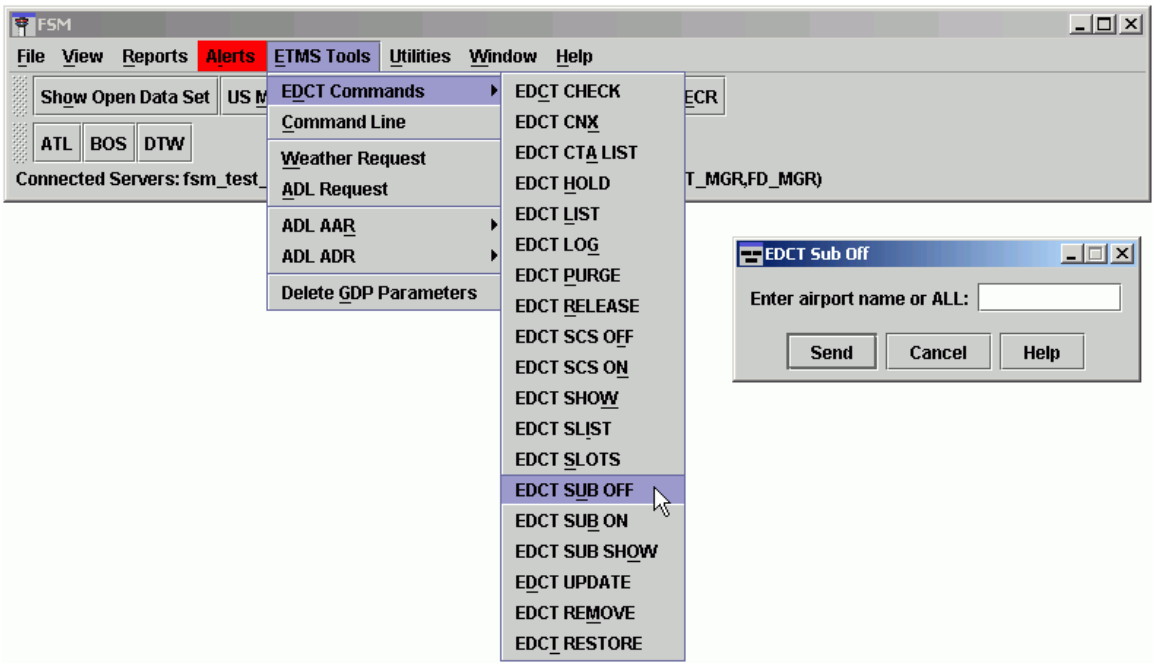

Figure 14-6: Turn Subs OFF

Issuing the Revision

Once you have determined the program parameters for an Actual GDP and the substitutions are turned off, there are two steps to enact the program and send the parameters out through the ADL. Program parameters for an Actual program are not sent through the ADL until Volpe receives both the program parameters (through an Advisory) and a matching FADT list (Autosend) with flight control times. Not until both sets of parameters are received will the program parameters and control times be sent through the ADL and the program implemented.

Select **Run** from the GDT *Setup* component to open the GDP Coversheet with the revised parameters. Send both the **Advisory** and **Autosend** from the Coversheet to implement the revision. Completing the revision is same as sending an initial GDP, see Chapter 10 for more detail.

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15 Issuing a Compression

At certain times during a GDP, you may find it favorable to run a Compression. The Compression function exchanges delayed flights with open slots in order to lessen the delay on those flights. Compression attempts to fill all available arrival slots with flights that, although delayed from their OETA, can still arrive at the available slot time. Compression tries to place flights from the same airline that created the slot in the new arrival slot, however, if this is not possible, other airlines' flights will be used to fill the arrival slots. A pure Compression can be beneficial to the performance of a GDP when there is limited pop-up traffic and non-compliance issues with flights in the stack hours.

Suspend Airline Substitutions and Slot Credit Substitutions

Before opening up GDT mode to issuing a Compression, the acceptance of airline substitutions and Slot Credit Substitutions (SCS) messages needs to be temporarily suspended. From the FSM Control Panel, select the **ETMS Tools** > *EDCT Commands* > *EDCT Sub Off* option to turn substitutions off. Enter the three-character airport ID into the EDCT SUB OFF dialog box and press **Send** to suspend substitutions for that airport. Airlines substitution or SCS messages will no longer be accepted after the *EDCT Sub Off* message is sent to ETMS. (See Figure 15-1).

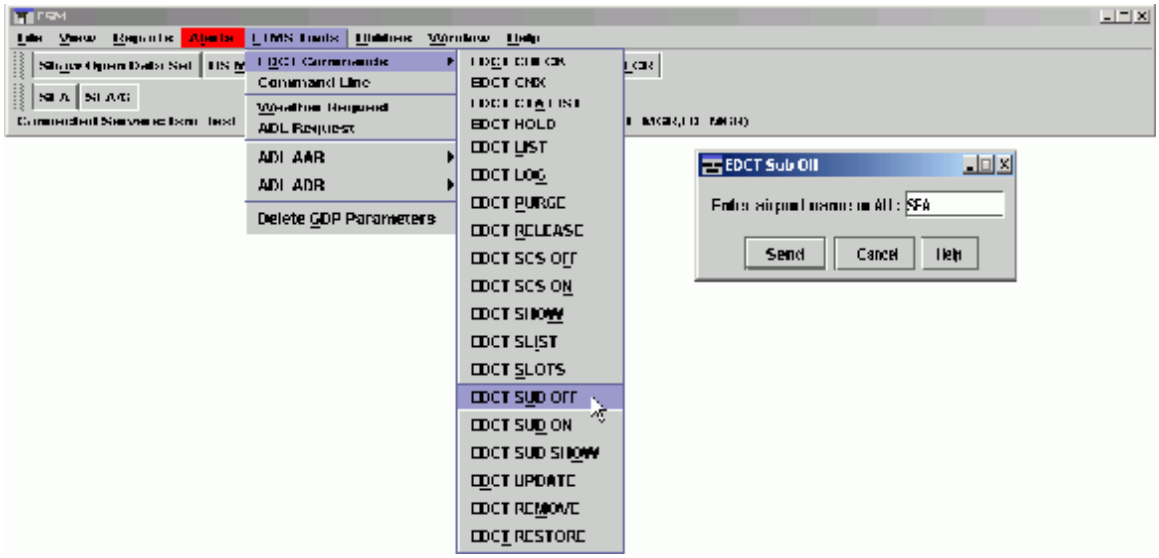

Figure 15-1: Turn Subs OFF

Open GDT Mode

Open Ground Delay Tools (GDT) mode by selecting a GDP monitored airport and then select the **GDT Setup** button from the main *Control Panel*. The four default GDT components will automatically be displayed for the selected airport. To perform the Compression function, select the **Program Type** > *Compression* option from the FSM GDT *Setup* component. Note that the GDT Data Graph will be blank and display "Power Run Not Available" when the Program Type *Compression* is selected. When the Program Type *Compression* is selected, the General Tab is the only Tab available for entering parameters, as shown in Figure 15-2.

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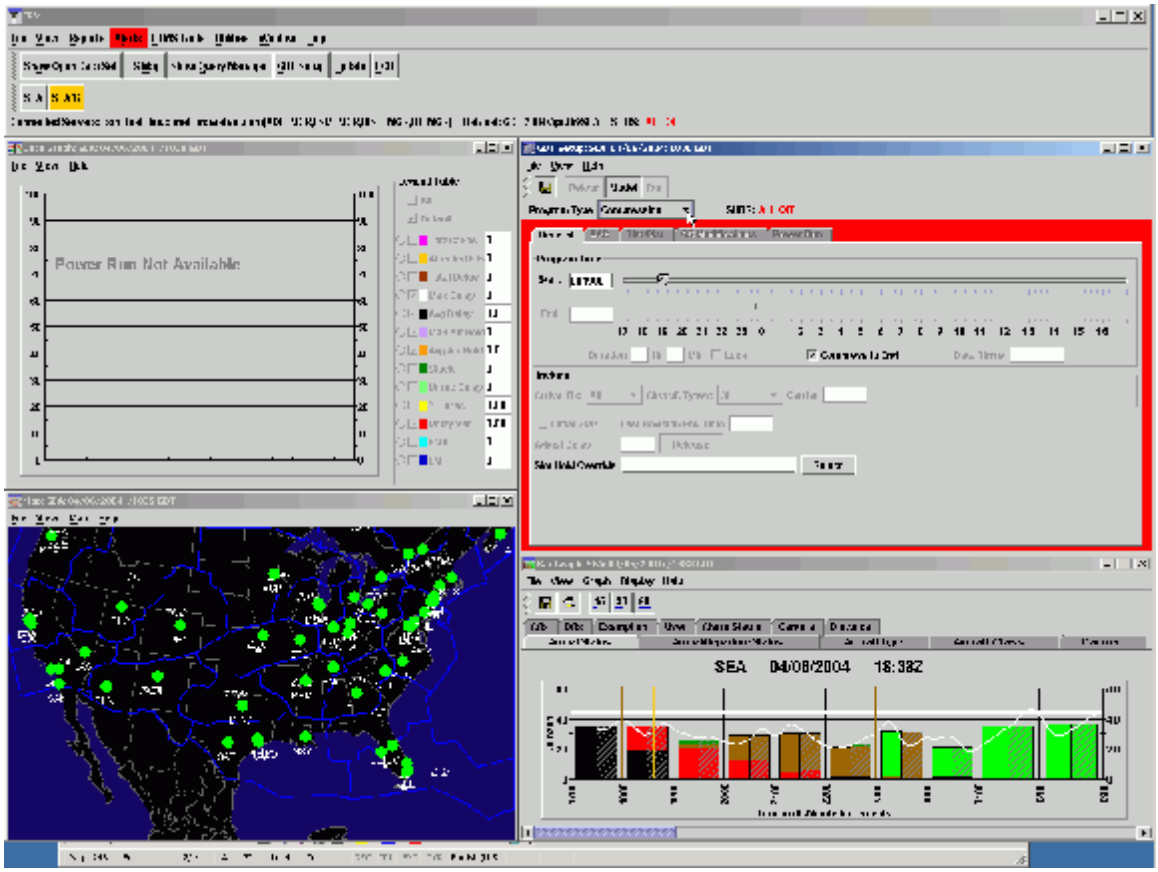

Figure 15-2: Compression Setup

Entering Parameters

On the General Tab, adjust the time range by clicking and dragging the pointers on the Start and End time lines or by manually typing a new time (ddhhmm) in the textboxes. When the **Compress To End** checkbox is selected, the end time and duration fields will remain empty. **Compress to End** indicates that all flights with control times will be included in the Compression. When **Compress to End** is deselected the current End time and durations will automatically be filled in by FSM. The Slot Hold Override functionality is available during *Compression*. Click **Select** to review the slots held (see Figure 15-3).

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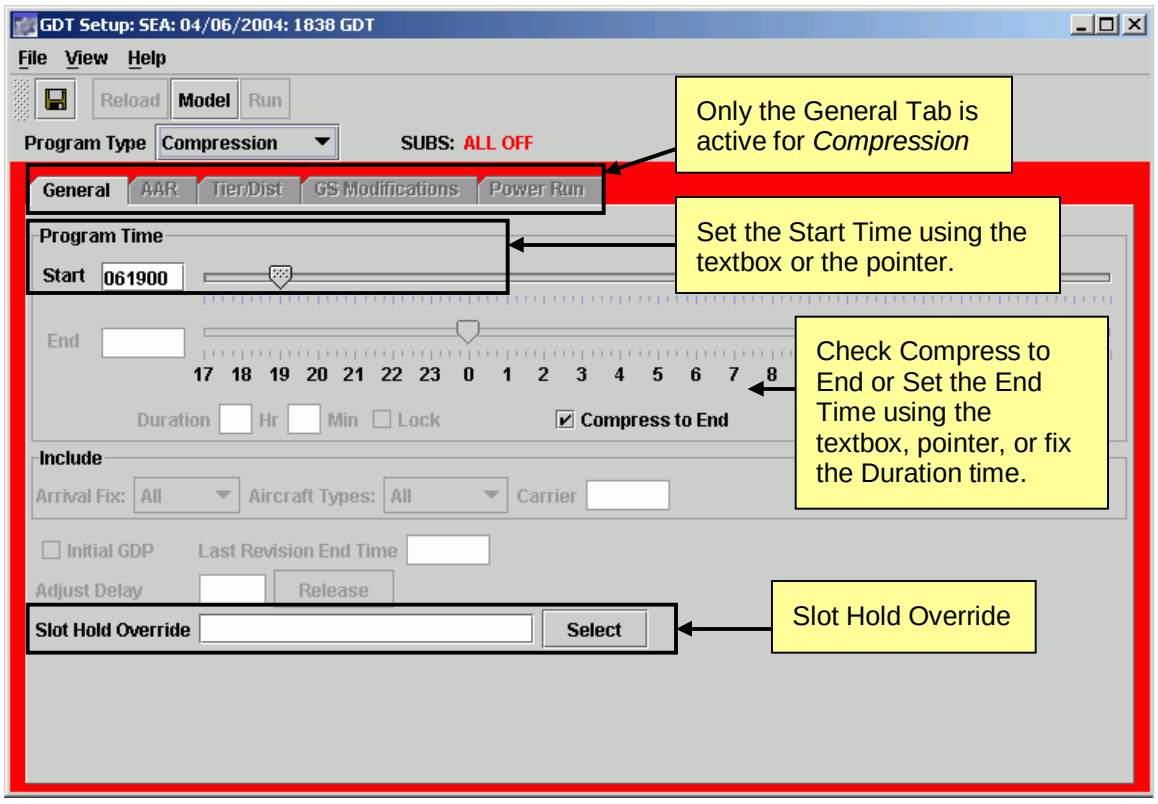

Figure 15-3: Compression GDT Setup Panel

Compression Parameters

- **Start:** Enter the time the Compression should begin. The default time is set to the current time.
- **End:** Enter the time at which the Compression should end.
- **Override Slot Holding:** Use this option to override any airlines that are currently holding slots at the monitored airport. To choose which airlines to override, click the **Select** button. The Select Slot Holding dialog box pops-up with the airlines currently holding slots. Click the box next to an airline name to check or uncheck that box. A checked box indicates the airline's slot holding status will be overridden. An unchecked box indicates that the airline will be allowed to hold its slots. Figure 15-4 shows that the Carrier DAL, AAL, and TRS are holding slots. DAL has two canceled (CNX) flights and two slots are being held. Checking the DAL checkbox will override that carriers slot holding status and will compress flights into the open slots.

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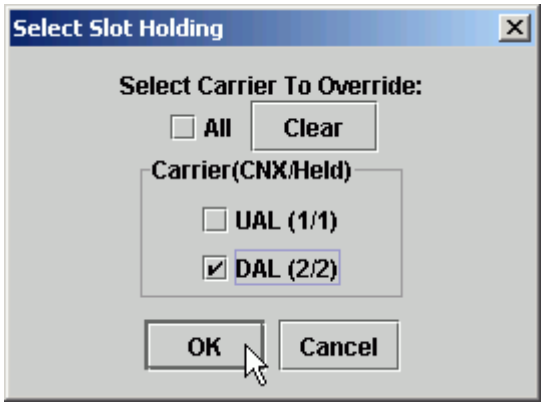

Figure 15-4: Select Slot Holding Dialog

If you mark a checkbox to override a carrier's slot holding, the checked carrier will be reflected on Compression GDT *Setup* component in the Slot Hold Override textbox (see Figure 15-5).

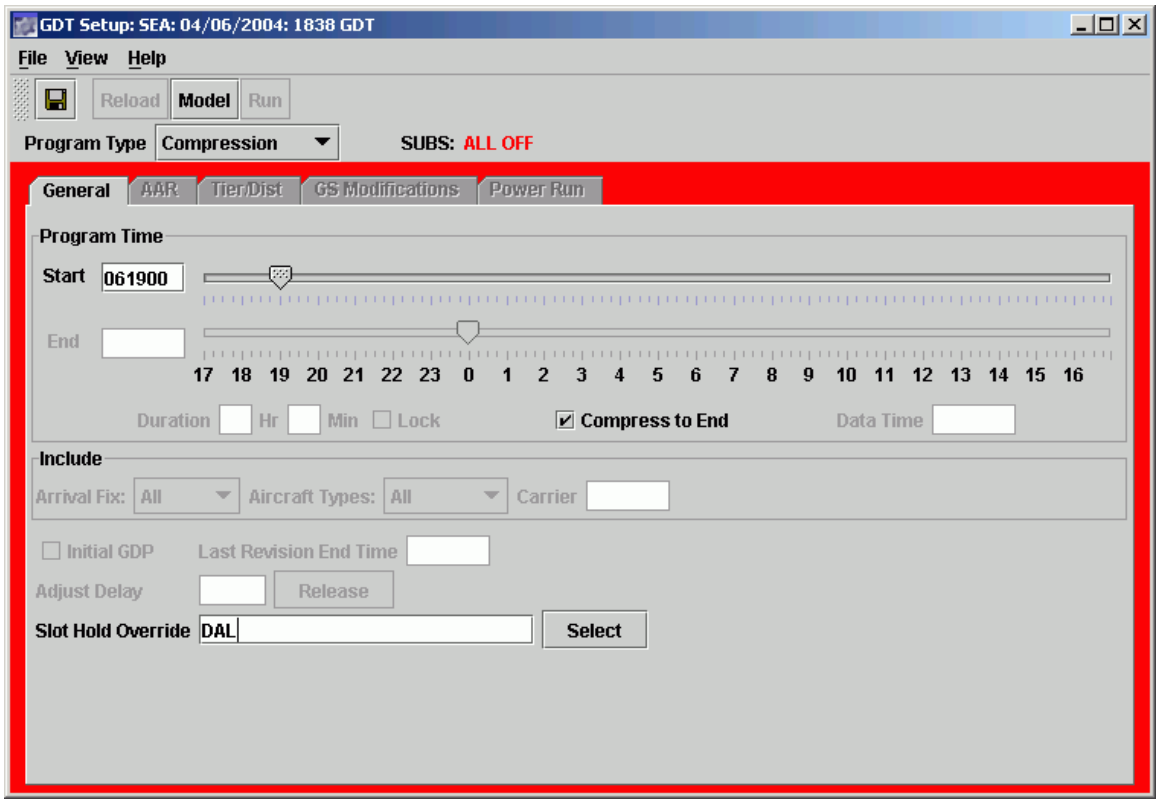

Figure 15-5: Compression Setup with DAL Slot Hold Override

Issue the Compression

Once the substitutions are turned off and you have modeled the *Compression*, there are two steps to enact the Compression and send the parameters out through the ADL. Compression parameters for an Actual program are not sent through the ADL until Volpe receives both the Autosend FADT List with flight control times and the matching program parameters (through an Advisory). Not until both sets of parameters are received

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will the program parameters and control times be sent through the ADL and the program implemented.

Run to Generate the Compression Coversheet

Click **Run** after your Compression setup has been completed and modeled from the GDT *Setup* component. Clicking the **Run** button will save the parameters to a file specified in FSM's configuration file and cause the Compression Coversheet to appear on the screen. Clicking **Run** will also generate two coversheet reports, a FADT and Analysis Report, which can be viewed by selecting **View** > *FADT* or *Analysis Report* from the Coversheet menu.

> **Note:** If you have modeled the Compression or there is enough information that a new model does not need to be completed, the red border around the GDT Setup Panel will not be present and the Run button is available. If you change any significant parameter in the GDT Setup component, you must press **Model** first, and then **Run**.

The Compression Coversheet contains all the Compression parameters data. After reviewing the Compression parameters, you will need to send both **Autosend** FADT control times and an **Advisory** from the Compression Coversheet to implement an actual Compression. (See Figure 15-6).

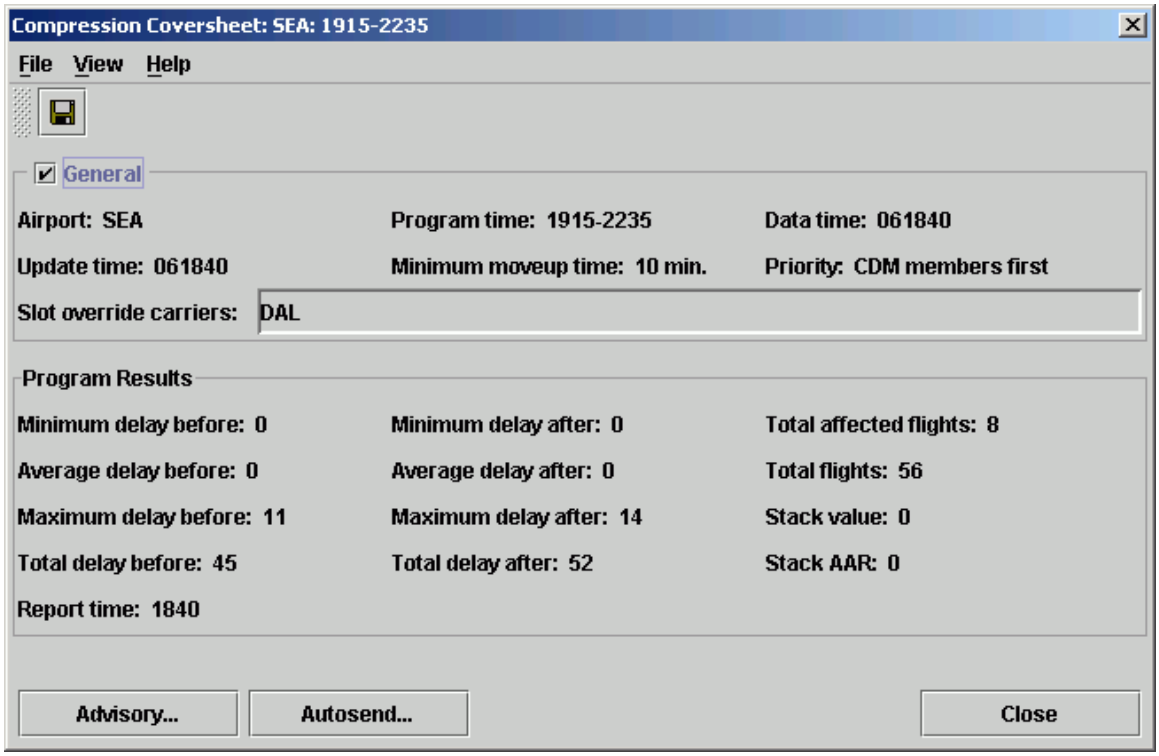

Figure 15-6: Compression Coversheet

Reviewing the program parameters is important before issuing the Compression. The following information is located on the Compression Coversheet.

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General Parameters

- **Airport**: The affected arrival airport where the GDP is issued.
- **Program Time**: The GDP time period (Start Time/End Time)
- **Data Time**: Current date and time (in Zulu time)
- **Update Time**: Last ADL time that passed before running the program.
- **Minimum Move up Time**: The minimum time that the Compression algorithm tries to move up a flight. If it cannot find a flight with at least 10 minutes of benefit, the algorithm with decrease the minimum move up time by 1-minute increments until a flight can be assigned a better slot time.
- **Priority**: Compression will prioritize CDM members first and then non-CDM members.
- **Slot Override Carriers:** Some carriers have the option to hold slots, or exclude their slots from compression, at an airport for future use. Overriding this option means that any carriers' slots that were held will be included in the compression at that airport.

Program Results Summary

- **Minimum delay before:** The minimum delay given to any one flight included in the parameters before the program was run.
- **Minimum delay after:** The minimum delay given to any one flight included in the parameters after the program was run.
- **Total Affected Flights:** Total number of flights included in the Compression (including canceled flights) and the number of flights actually affected (non-exempt) by the Compression (excluding canceled flights). Note that any ATC Delay statistics are determined by (Max [0, CTA - BETA]).
- **Average delay before:** Total delay of flights in the Compression divided by the Total Affected Flights in the operation before the program was run.
- **Average delay after:** Total delay of flights in the Compression divided by the Total Affected Flights in the operation after the program was run.
- **Total Flights:** The total numbers of flights arriving at the monitored airport within the program start and end time.
- **Maximum delay before:** The longest delay assigned to any one flight in the GDP before the program was run.
- **Maximum delay after:** The longest delay assigned to any one flight in the GDP after the program was run.
- **Stack Value:** Number of flights pushed out of the GDP period as a result of running the Compression.
- **Total delay before:** The sum of all delays resulting from this GDP operation in minutes before the program was run. Determined by CTA - OETA
- **Total delay after:** The sum of all delays resulting from this GDP operation in minutes after the program was run. Determined by CTA - OETA

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- **Stack AAR:** The AARs that occur in the hours after the end time of the GDP, but that still have CTA flights in them because of GDP delay.
- **Report Time**: The current date and time in DDHHMM format. Note that the time is according to the 24-hour clock in Zulu time.

Compression Coversheet Menu Options

There are three file menu options available on the Compression Coversheet: **File, View** and **Help**.

1. **File Menu**

File > *Save As…*Opens a previously created coversheet in FSM. The default format is fsmc.<airport> followed by the date, time, and compression information.

File > *Save Web coversheet As…*Saves the Coversheet information to a file for later use. Note that the Coversheet will save itself in a pre-defined file format that may not exactly match the software display on your computer monitor. The default format is covr.<airport> followed by the date, time, and compression information.

File > *Close* - Closes the Compression Coversheet window.

2. **View Menu**

View > *FADT* – Displays the FADT Report.

View > *Analysis* – Displays the Analysis Report

View > *Carrier Statistics* – Display the Carrier Statistics report.

3. **Help Menu**

Help > *Coversheet* – Accesses the web-based on-line help for Compression Coversheet.

Issuing a Compression through Autosend

Click **Autosend** from the Compression Coversheet to send the FADT file to all users, including airlines.

Note: If you choose Compose **Advisory** or **Autosend** more than 15 minutes after switching to GDT Setup, FSM will warn you to return to click **Reload** from the GDT Setup component and get the most recent data from an updated ADL before continuing with the *Compression.*

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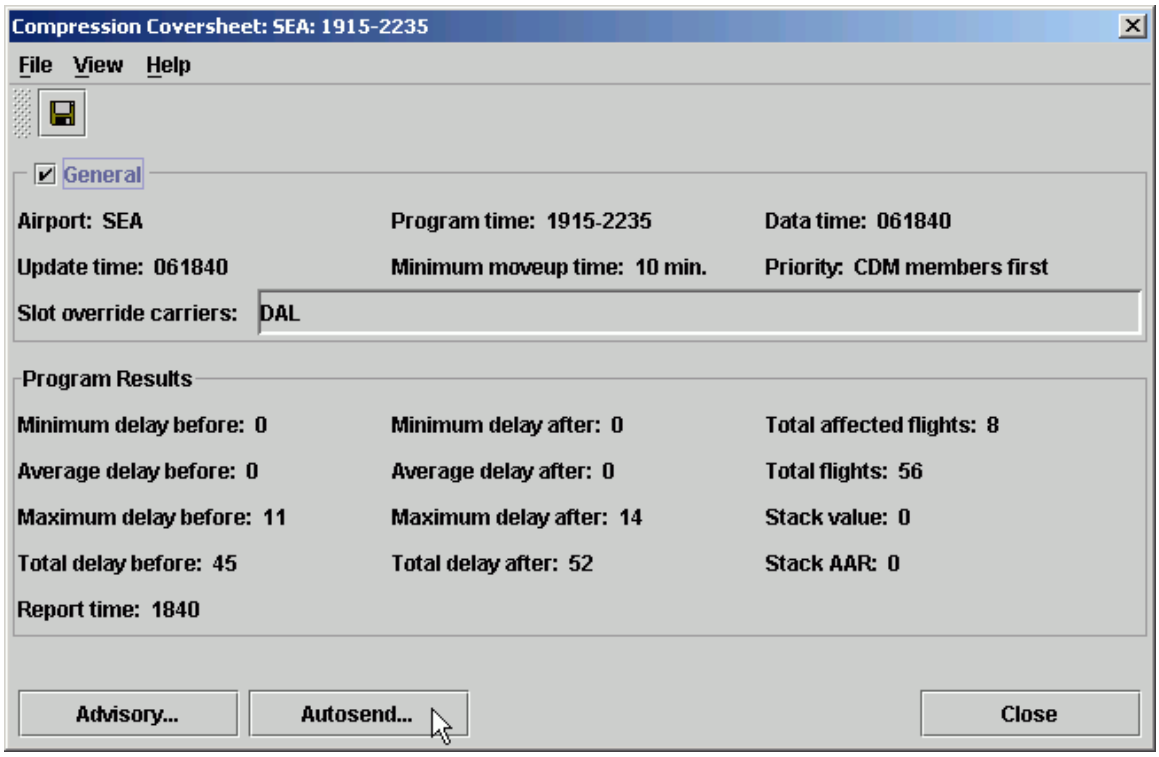

Figure 15-7: Compression Coversheet - Autosend

Send the Advisory

To compose either an Actual or Proposed Compression Advisory, click the **Advisory** button from the Compression Coversheet and the Compression Advisory window appears (Figure 15-8). This window contains all the Compression parameters, which have been set and some fields in the *Remarks* sections that must be filled out before sending an advisory.

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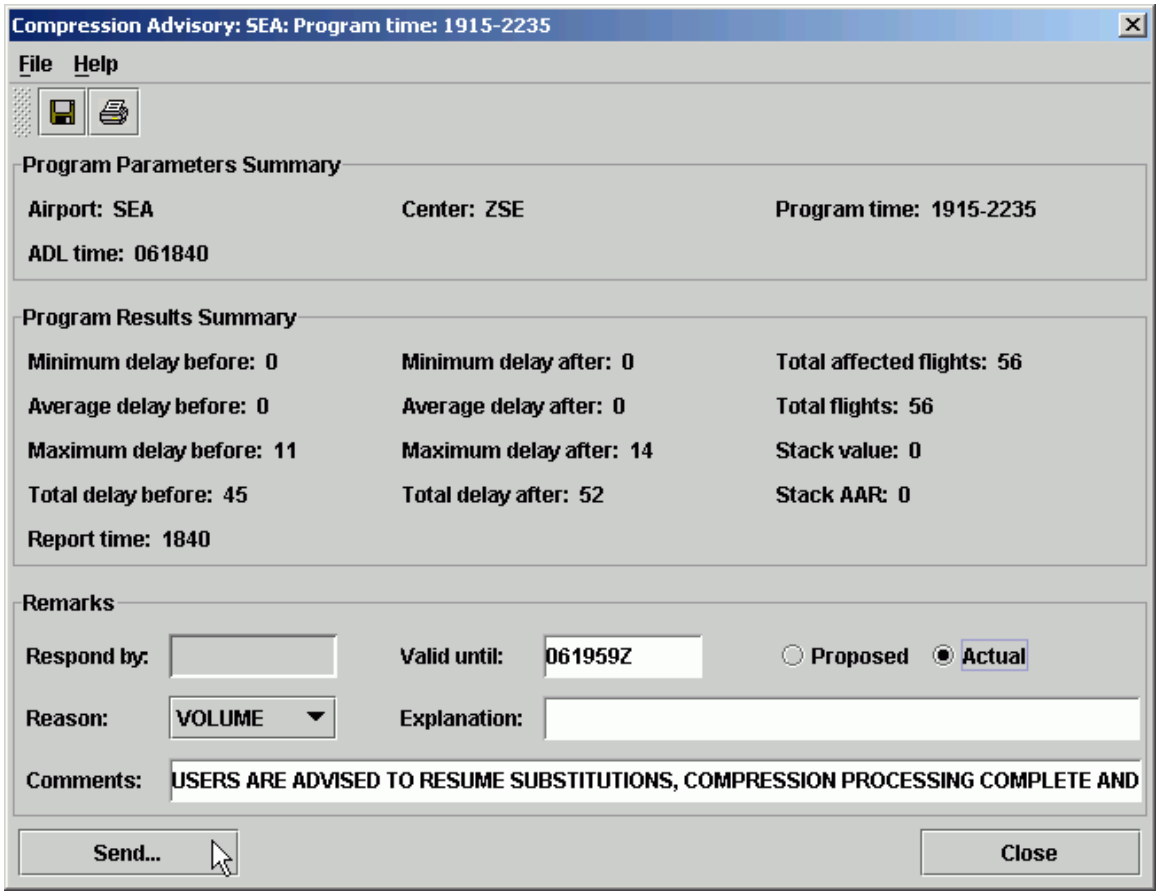

Figure 15-8: Compression Advisory Window

The following information is found in the GDP Advisory:

Program Parameters Summary

- **Airport**: The airport for which a ground stop is being enacted.
- **Center**: The center that includes the affected airport.
- **Program Time**: The times at which the GDP will start and end.
- **ADL Time**: The time of the last ADL used before the program was run.

Program Results Summary

The Program Results summary on the Advisory window contains the exact same information as the Compression Coversheet Results Summary.

Remarks

The remarks section must be filled out before sending an Advisory.

- **Respond By (Proposed Advisory only):** The time by which users must respond to a Proposed GDP. It is normally defined as the current time plus 30 minutes. That time is then rounded up to the next 15-minute time increment. For example, if the current time is

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1812, the Respond By time is 1845 (1812 + 30 = 1842. Round up to the nearest 15-minute increment is 1845).

- **Valid Until**: The time at which the Advisory message will expire. Normally defined as the Respond By time plus 20 minutes and rounded up to the end of the hour. For example, if the Respond By time is 1845, the message is valid until 1959. The message could also expire at the same time the program ends.
- **Proposed/Actual**: The two types of advisories available to send. A Proposed Advisory lets users know about a potential GDP and allows users to send comments about the parameters before the program is enacted. An Actual Advisory lets users know that a program is definitely going to be enacted and does not allow users to comment on the parameters.
- **Reason**: Select a reason for running the GDP from the available pull down menu. Click to pull the menu down and then click to select one of the available reasons: Weather, Volume, Runway, Equipment, and Other.
- **Explanation**: If you select "Other" in the Reason field, you must type a reason or other commentary in the Explain field before an Advisory can be sent.
- **Comments**: This field is available for any additional comments about the program you feel are necessary.

You must either select the **Proposed** or **Actual** radio button to send the appropriate Advisory.

- When a **Proposed Advisory** is sent, FSM will copy the Advisory file to an HP machine at the FAA's ATCSCC. It will also send the GDP parameters to Volpe for inclusion in the next ADL. A Proposed GDP is a program being recommended by the FAA, but not immediately implemented. A Proposed GDP allows NAS users time to comment on the proposed parameters and may change before an actual program is implemented.
- When an **Actual Advisory** is sent, FSM will copy the Advisory file to an HP machine at the FAA's ATCSCC and send the parameters to Volpe. However, Volpe will not send the program parameters in an ADL until it receives the matching FADT list with flight control times for the program. The FADT list is sent through the Autosend function on the Compression Coversheet.

Once you have completed the Compression Advisory, press **Send** and the program parameters will be emailed to all parties involved in the program, including the Volpe Hub. A checkmark will appear next to the **Send** button on the Advisory window and next to the **Advisory** button on the Compression Coversheet to indicate that the advisory has already been sent.

If the parameters are for a Proposed Advisory, Volpe will send out the parameters immediately in the next ADL. When parameters for an Actual Advisory are sent, Volpe will ensure that it has received the associated FADT file (Autosend) with flight control times for the program before sending any parameters through the ADL.

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When you click **Close**, no action will be taken from the Compression Advisory window.

Coversheet Reports

FADT Report

FADT reports are generated when any TMI operation is **Run**. A FADT reports contains program parameters and delay statistics for the Compression. To review the FADT file, select **View** > *FADT Report* from the Compression Coversheet and the FADT Report window will appear displaying the program information, as shown in Figure 15-9.

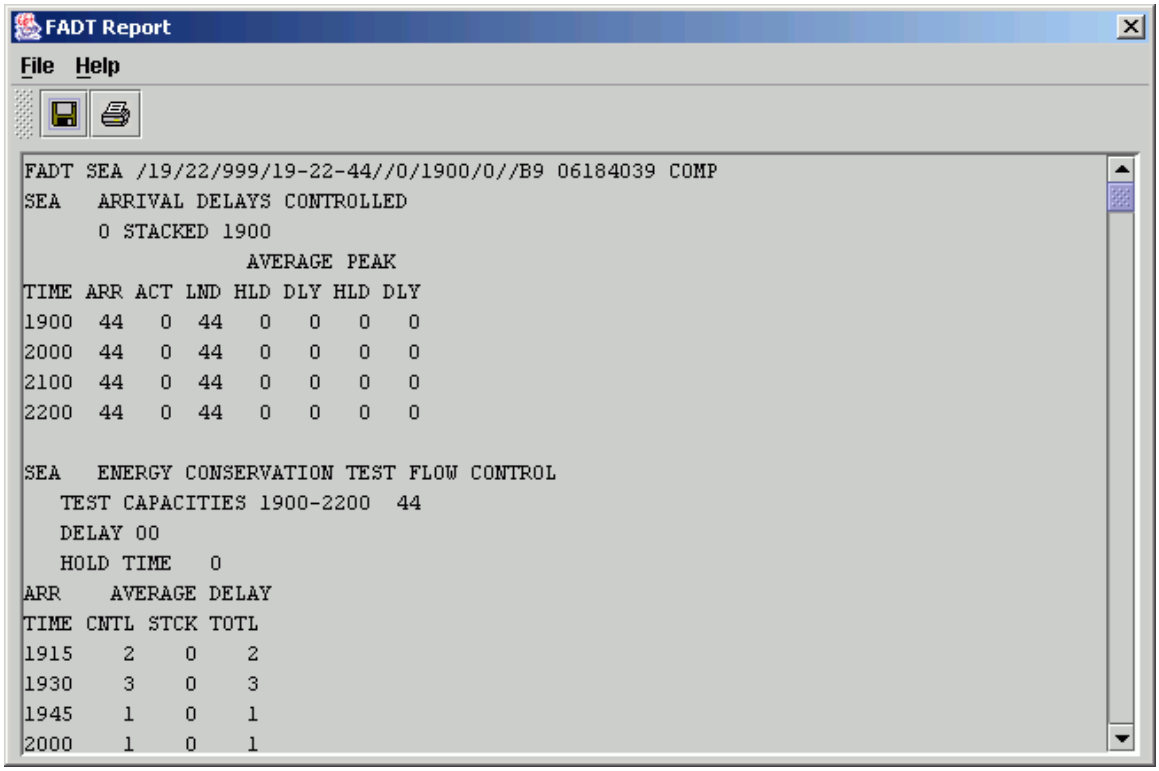

Figure 15-9: FADT Report

Analysis Report

FSM also allows you to analyze the Compression after selecting "**Run**" from the *GDT Setup* component. To evaluate the effects of a Compression after the operation is run, select **View** > *Analysis Report* from the Coversheet (The Coversheet is generated when you click **Run** from the GDT *Setup* component after setting the desired parameters). FSM automatically opens the spreadsheet application you have indicated in your configuration files to display the Analysis Report.

Carrier Statistics

To view the Carrier Statistics select **View** > *Carrier Statistics* from the Compression Coversheet or it can be viewed from the *Control Panel* by selecting **Reports** > *Carrier Statistics*. Make sure the desired airport is in focus to review the correct airport's carrier statistics when selecting Carrier Statistics from the *Control Panel*. From the Carrier Statistics report you have the option to view ATC delay or ABS (total delay including airline delay). The Carrier Statistics report is based on flight's ETA and displays specific

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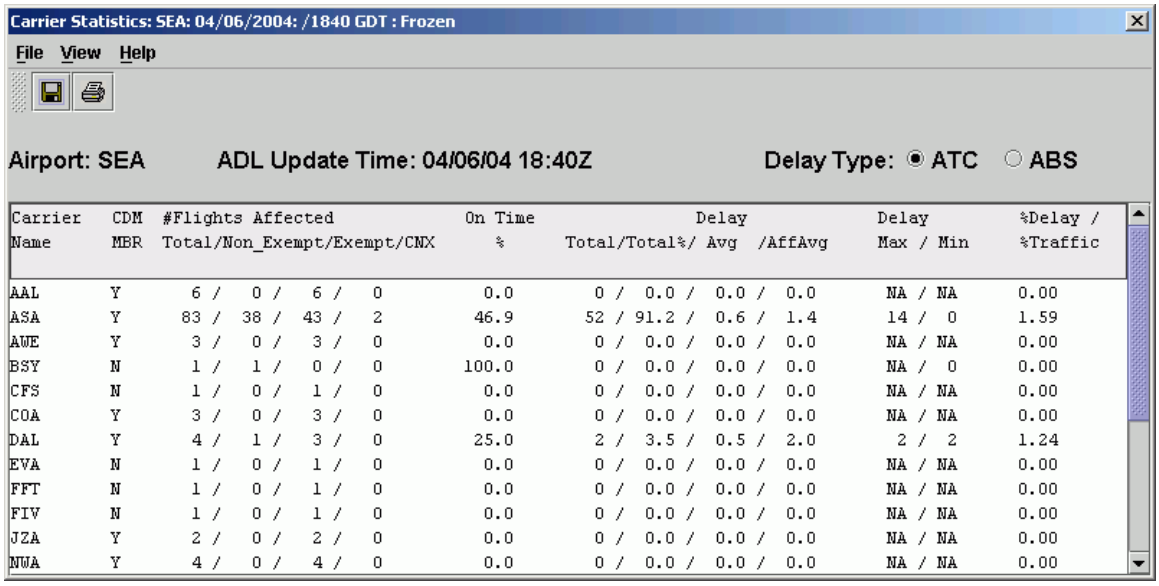
delay information for each carrier's flights. The Carrier Statistics report is particularly helpful to airlines. Airlines can view how the Compression is affecting them. Figure 15-10 is an example of the carrier statistic report being viewed by ATCSCC personnel. Airlines would only see their own call sign and any sub-carriers. All other airlines would be considered "Other." For more information on the Carrier Statistics report, please see Chapter 8.



Carrier Name	CDM MBR	#Flights Affected Total/Non_Exempt/Exempt/CNX	On Time %	Delay Total/Total%/ Avg /AffAvg	Delay Max / Min	%Delay / %Traffic
AAL	Y	6 / 0 / 6 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
ASA	Y	83 / 38 / 43 / 2	46.9	52 / 91.2 / 0.6 / 1.4	14 / 0	1.59
AWE	Y	3 / 0 / 3 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
BSY	N	1 / 1 / 0 / 0	100.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00
CFS	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
COA	Y	3 / 0 / 3 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
DAL	Y	4 / 1 / 3 / 0	25.0	2 / 3.5 / 0.5 / 2.0	2 / 2	1.24
EVA	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
FFT	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
FIV	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
JZA	Y	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
NWA	Y	4 / 0 / 4 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00

Figure 15-10: Carrier Statistics

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16 Should a Compression or Revision be used?

After an initial GDP has been issued, the airport's demand and/or capacity fluctuate and a Compression or Revision may be necessary to control the traffic flow into the airport. Monitor the GDP delivery (see Chapter 11) if demand continues to exceed capacity decide whether a Compression or Revision may be necessary.

When to use a Compression

Compression may be the optimal operation when there is no interest in extending the GDP or changing the AAR and there are a large number of canceled flights with slots ahead of operational flights in the stack hours. The Stack hours are defined as the stack of flights after the end time of the GDP. Looking at the FSM Bar Graph can easily identify the number of canceled flights in a stack hour. Ensure that **View** > *Show Cancellations* checkbox is selected or use CTRL+C on the Bar Graph to view all cancelled flights. Rolling your mouse over the cyan colored flights displays a tool tip with the number of cancelled flights for that hour. Figure 16-1 illustrates numerous cancelled flights ahead of operational flights in the stack hours (2300-0100).

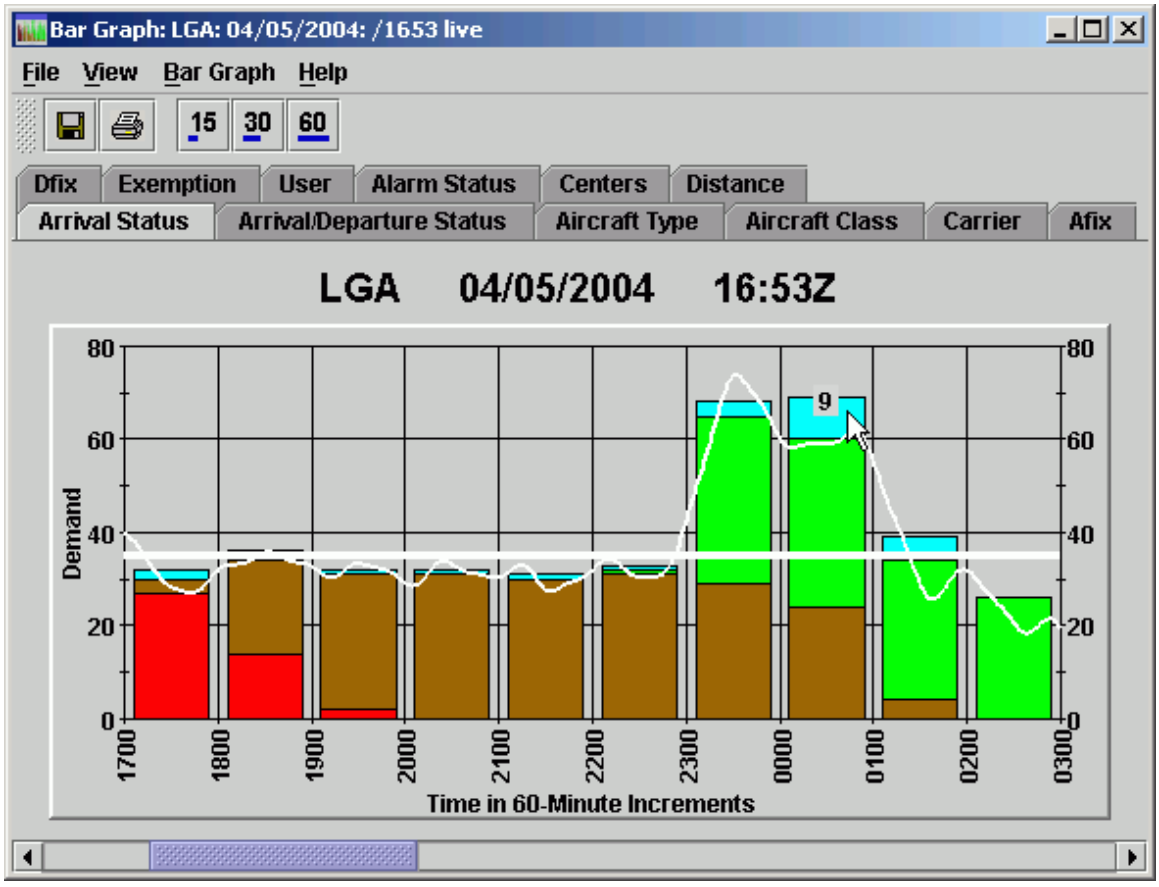

Figure 16-1: Stacked Hours

You can also get a quick visual idea of where the canceled flights (squares) and delayed flights (triangles) are located from the FSM Time Line. If there are a large amount of

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squares throughout the program time, issuing a compression will be helpful to reallocate operational flights to the slots held by the canceled flights.

Running Compression with End Time of 9999 will decrease delay on the operational flights and move the canceled flights to the end of the program. Compression can reduce both the total delay and average delay of a GDP. For more information on Issuing a Compression, see Chapter 15.

When to use a Revision

A Revision is used when there is an interest in extending the End Time and/or changing the program's AAR. In cases where the there is no interest is modifying the program parameters but there are several pop-up flights, a Revision may be the most favorable option. A Revision will capture the pop-up flights in the system and assign them control times, where as a Compression will only capture controlled flights already included in the current GDP.

Using Real-Time FSA

Before running Compression, check with RT FSA to make sure that there are not many pop-ups, which would dictate a Revision instead. To view the RT FSA Performance Report, select the FSA link from the ATCSCC OIS web page menu. From the main page of RT FSA click on the link for the airport of interest, this will display the Performance Report by default, as shown in Figure 16-2 . Check to see if the Number of Slots equals the program rate. If the program is delivering the requested Program Rate, but there are several 'extra demand' flights, a revision or compression will be needed. Pop-ups that do not have a slot will be listed at the top of each hour in the Extra Demand flight lists. To view the Extra Demand flight list for an hour, click on the Extra Demand count for that hour. From the Extra Demand list, the comments section identifies if the flight is a pop-up.

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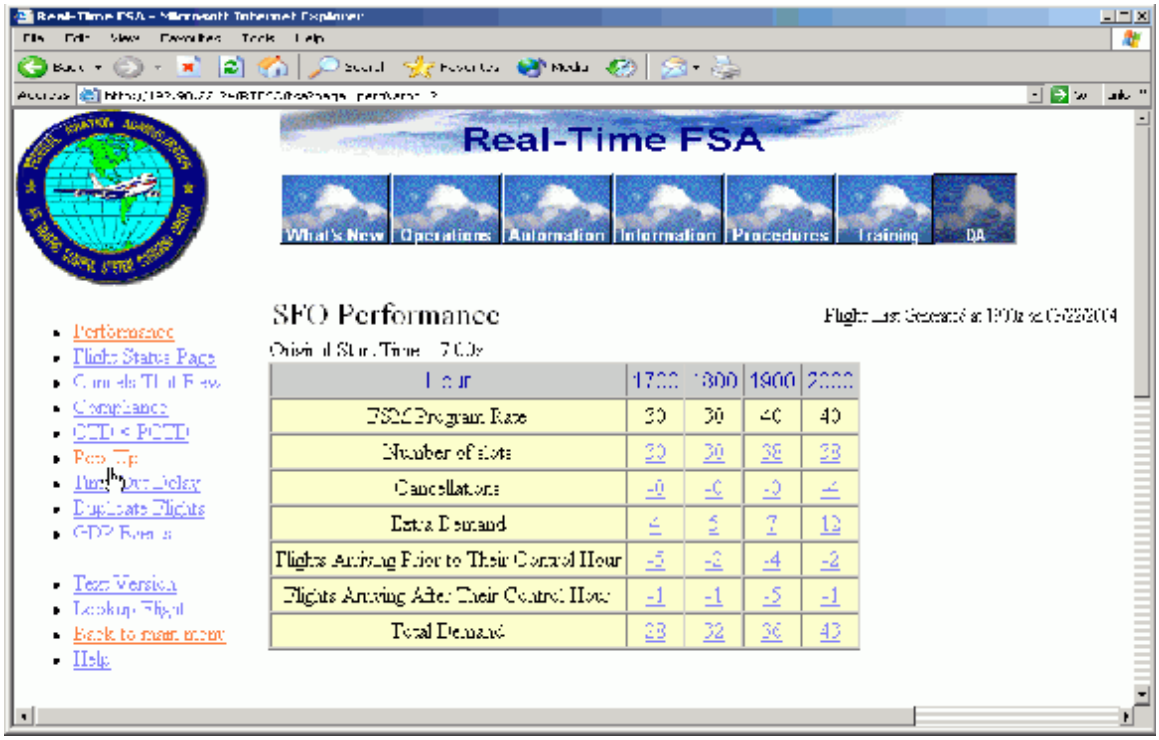

Figure 16-2: RT FSA Performance Report

To view the RT FSA Pop-ups Report, select the Pop-ups link from the menu bar to the left of the Performance Report. Check to see how many new pop-ups are in the system. New pop-ups will not be assigned a Slot Time. The pop-ups report is sorted by Pop-up Time, but the list can be sorted by double clicking on any underlined heading title. For example, airlines could sort by ACID to see how many of their flights are considered pop-up flights.

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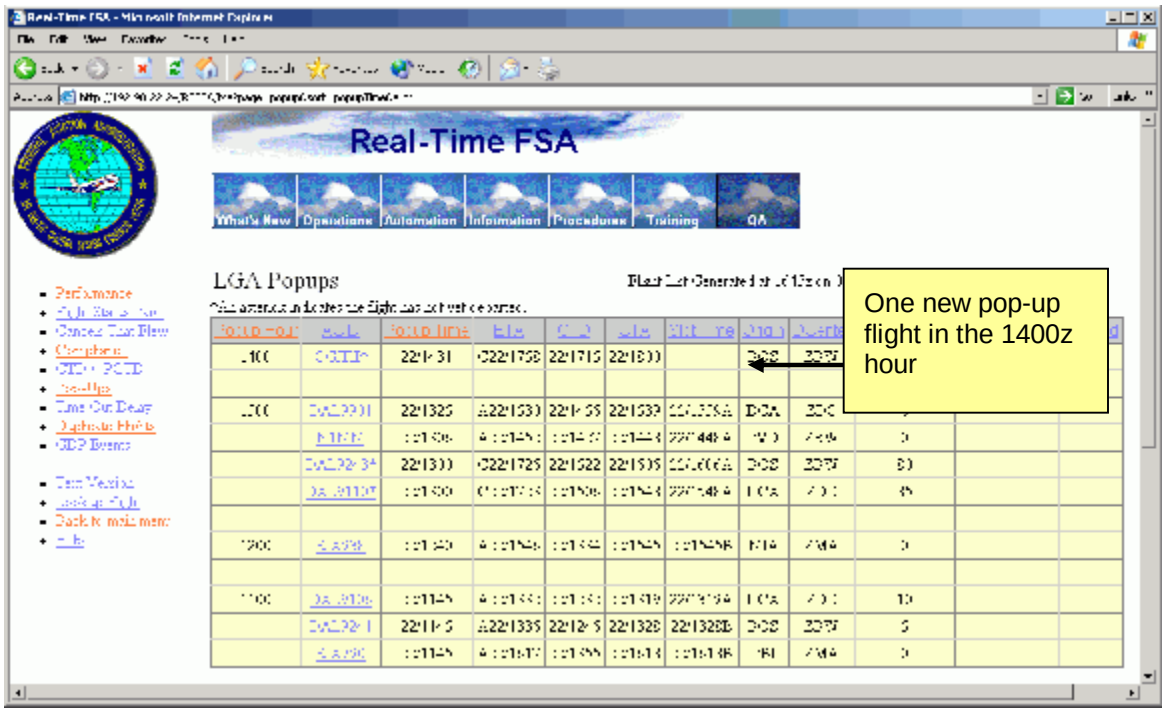

Figure 16-3: RT FSA Pop-ups Report

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17 Airborne Holding and Blanket Programs

Airborne Holding

Airborne Holding is used by traffic management specialists to determine the necessity of a GDP. In certain situations, putting delay on flights en route may be a better option than delaying flights on the ground. The airborne holding algorithm in FSM produces the amount of expected airborne holding delay, defined as ASLOT - ETA, which would result from running a program.

To run the Airborne Holding algorithm, select the **Program Type** *Airborne Holding* option from the GDT *Setup* component. Selecting the *Airborne Holding* option enables the General and AAR Tabs only. Using the two tabs, you will need to fill out the parameters of the air traffic scenario you wish to model. The only input parameters for Airborne Holding are the General Tab's Start and End Time and the AAR Tab parameters.

General Tab Modifications

From the General Tab, specify the Start and End Time of the program. All other fields are grayed out and un-editable, as shown in Figure 17-1.

1. **Start:** Enter the date and time when the *Blanket* program will begin.
2. **End:** Enter the data and time when the program should end. The default program period lasts until the ETA of the last CTA flight.

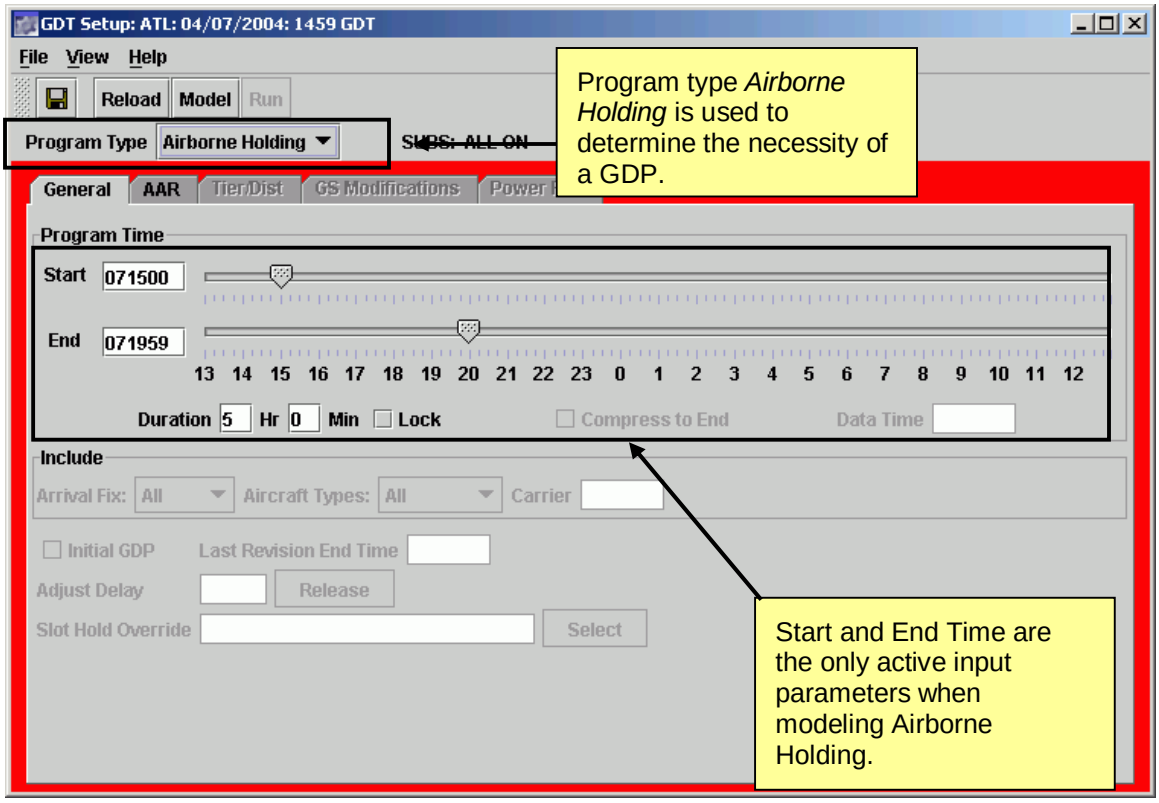

Figure 17-1: Airborne Holding General Tab

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AAR Tab Modifications

Click on the AAR tab to enter the reduced AAR for that airport to base your Airborne Holding Model.

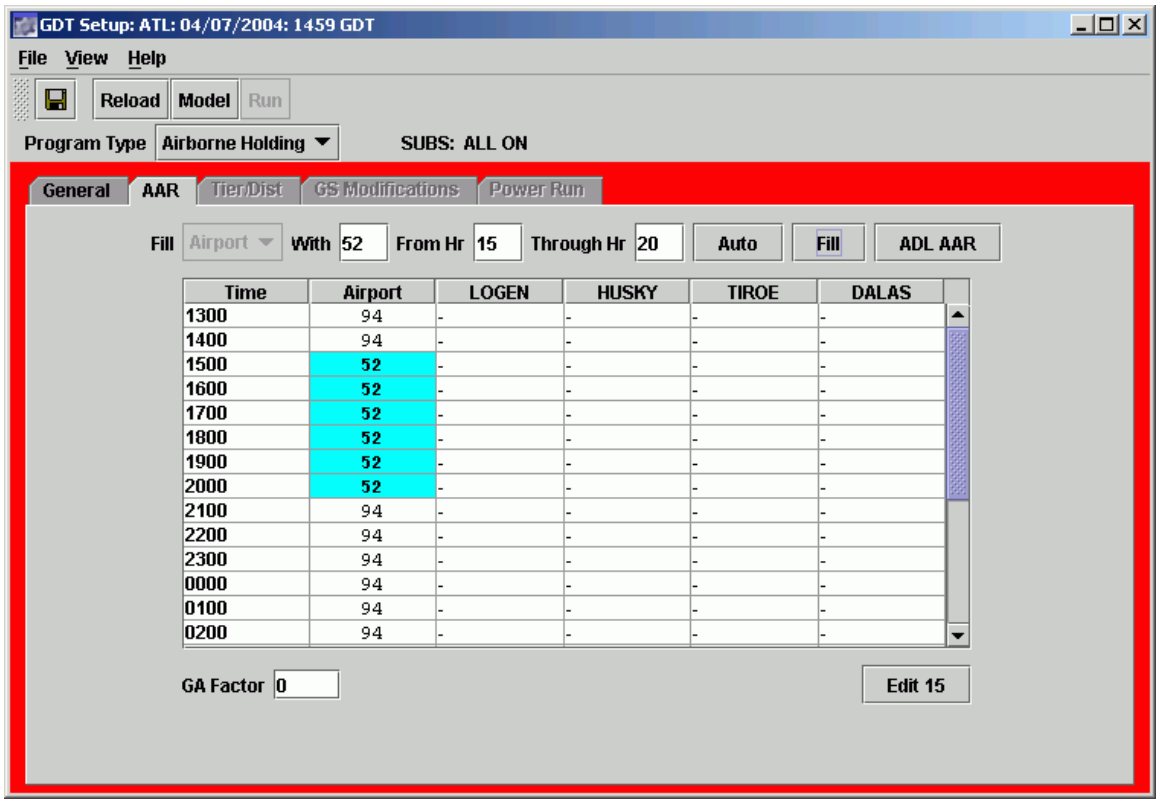

Figure 17-2: Airborne Holding AAR Tab

A few steps are used to quickly change the rate. First enter the program rate into the **With** textbox then click the **Auto** button to fill the [From Hr] and [Through Hr] textboxes with the program start and end times that were specified on the General tab. Click the **Fill** button to change and fill in the new modified AAR for the program hours. In the example above, a rate of 52 was filled in for the hours of 1500z – 2000z. The rate for individual hours may be adjusted in 15-minute increments by selecting the appropriate textbox for the hour and then clicking the **Edit 15** button or by right-clicking the textbox you wish to edit. For more information see Chapter 4 AAR Tab.

Setting a GA factor provides room for suspected pop-up flights that show up in a given hour during the TMI. For example, if an airports AAR is set to 60 and there is a GA factor of 3, therefore FSM will model the program based on an AAR of 57, effectively leaving some cushion for the suspected pop-up flights.

Airborne Holding Reports

Running the Airborne Holding algorithm generates two reports: Airborne Holding Flight List and Carrier Statistics. The **Airborne Holding Flight List** appears automatically when the Program Type *Airborne Holding* is **Run**, as shown in Figure 17-3.

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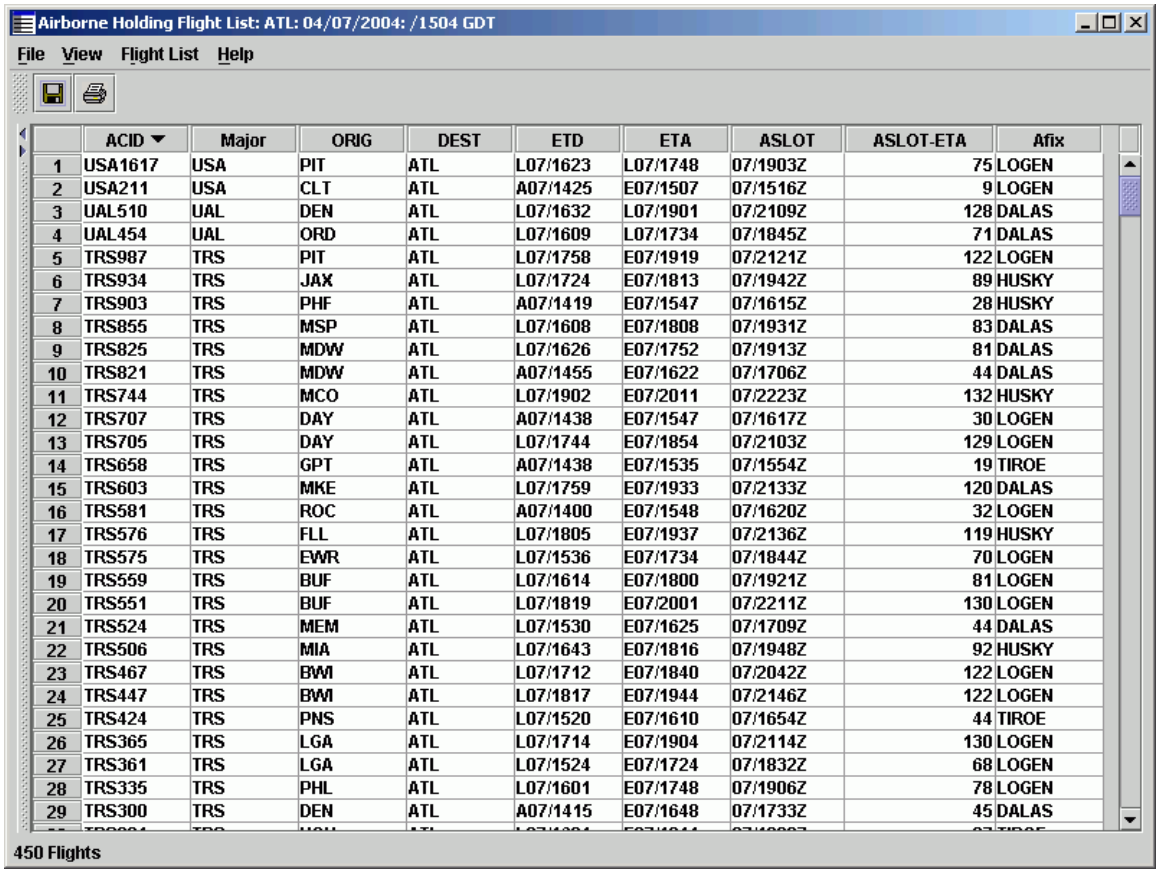
1. **Airborne Holding Flight List:**

The Flight List contains information for all flights that meet the operation parameters. The Flight List includes ASLOT, which is the arrival slot the flights will use, and ASLOT – ETA, which is the amount of expected airborne holding delay. For more information on the Flight List Format, See Chapter 6 Flight Lists.



	ACID	Major	ORIG	DEST	ETD	ETA	ASLOT	ASLOT-ETA	Afix
1	USA1617	USA	PIT	ATL	L07/1623	L07/1748	07/1903Z	75	LOGEN
2	USA211	USA	CLT	ATL	A07/1425	E07/1507	07/1516Z	9	LOGEN
3	UAL510	UAL	DEN	ATL	L07/1632	L07/1901	07/2109Z	128	DALAS
4	UAL454	UAL	ORD	ATL	L07/1609	L07/1734	07/1845Z	71	DALAS
5	TRS987	TRS	PIT	ATL	L07/1758	E07/1919	07/2121Z	122	LOGEN
6	TRS934	TRS	JAX	ATL	L07/1724	E07/1813	07/1942Z	89	HUSKY
7	TRS903	TRS	PHF	ATL	A07/1419	E07/1547	07/1615Z	28	HUSKY
8	TRS855	TRS	MSP	ATL	L07/1608	E07/1808	07/1931Z	83	DALAS
9	TRS825	TRS	MDW	ATL	L07/1626	E07/1752	07/1913Z	81	DALAS
10	TRS821	TRS	MDW	ATL	A07/1455	E07/1622	07/1706Z	44	DALAS
11	TRS744	TRS	MCO	ATL	L07/1902	E07/2011	07/2223Z	132	HUSKY
12	TRS707	TRS	DAY	ATL	A07/1438	E07/1547	07/1617Z	30	LOGEN
13	TRS705	TRS	DAY	ATL	L07/1744	E07/1854	07/2103Z	129	LOGEN
14	TRS658	TRS	GPT	ATL	A07/1438	E07/1535	07/1554Z	19	TIROE
15	TRS603	TRS	MKE	ATL	L07/1759	E07/1933	07/2133Z	120	DALAS
16	TRS581	TRS	ROC	ATL	A07/1400	E07/1548	07/1620Z	32	LOGEN
17	TRS576	TRS	FLL	ATL	L07/1805	E07/1937	07/2136Z	119	HUSKY
18	TRS575	TRS	EWR	ATL	L07/1536	E07/1734	07/1844Z	70	LOGEN
19	TRS559	TRS	BUF	ATL	L07/1614	E07/1800	07/1921Z	81	LOGEN
20	TRS551	TRS	BUF	ATL	L07/1819	E07/2001	07/2211Z	130	LOGEN
21	TRS524	TRS	MEM	ATL	L07/1530	E07/1625	07/1709Z	44	DALAS
22	TRS506	TRS	MIA	ATL	L07/1643	E07/1816	07/1948Z	92	HUSKY
23	TRS467	TRS	BWI	ATL	L07/1712	E07/1840	07/2042Z	122	LOGEN
24	TRS447	TRS	BWI	ATL	L07/1817	E07/1944	07/2146Z	122	LOGEN
25	TRS424	TRS	PNS	ATL	L07/1520	E07/1610	07/1654Z	44	TIROE
26	TRS365	TRS	LGA	ATL	L07/1714	E07/1904	07/2114Z	130	LOGEN
27	TRS361	TRS	LGA	ATL	L07/1524	E07/1724	07/1832Z	68	LOGEN
28	TRS335	TRS	PHL	ATL	L07/1601	E07/1748	07/1906Z	78	LOGEN
29	TRS300	TRS	DEN	ATL	A07/1415	E07/1648	07/1733Z	45	DALAS

Figure 17-3: Airborne Holding Flight List

2. **Carrier Statistics:**

The *Carrier Statistics Based on ETA After GDP (Airborne Holding)* displays specific delay information for each carrier's flights. The Carrier Statistics report is arranged in several columns for easy access to important information. The Carrier Statistics report appears automatically when the Program Type *Airborne Holding* is **Run**, as shown in Figure 17-4.

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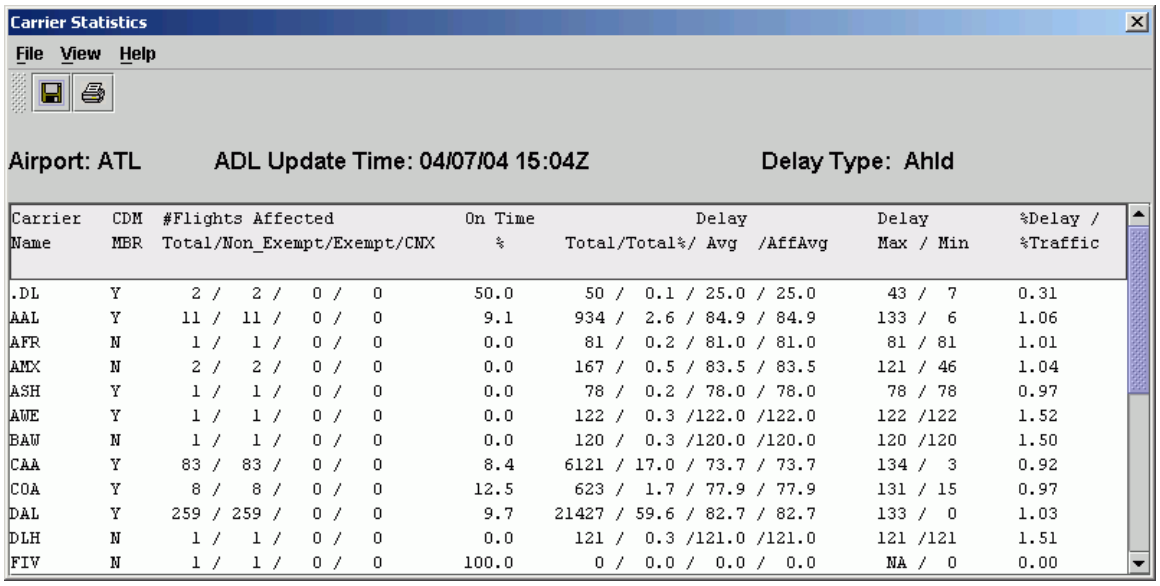

Carrier Name	CDM MBR	#Flights Affected Total/Non_Exempt/Exempt/CNX	On Time %	Delay Total/Total%/ Avg /AffAvg	Delay Max / Min	%Delay / %Traffic
.DL	Y	2 / 2 / 0 / 0	50.0	50 / 0.1 / 25.0 / 25.0	43 / 7	0.31
AAL	Y	11 / 11 / 0 / 0	9.1	934 / 2.6 / 84.9 / 84.9	133 / 6	1.06
AFR	N	1 / 1 / 0 / 0	0.0	81 / 0.2 / 81.0 / 81.0	81 / 81	1.01
AMX	N	2 / 2 / 0 / 0	0.0	167 / 0.5 / 83.5 / 83.5	121 / 46	1.04
ASH	Y	1 / 1 / 0 / 0	0.0	78 / 0.2 / 78.0 / 78.0	78 / 78	0.97
AWE	Y	1 / 1 / 0 / 0	0.0	122 / 0.3 /122.0 /122.0	122 /122	1.52
BAW	N	1 / 1 / 0 / 0	0.0	120 / 0.3 /120.0 /120.0	120 /120	1.50
CAA	Y	83 / 83 / 0 / 0	8.4	6121 / 17.0 / 73.7 / 73.7	134 / 3	0.92
COA	Y	8 / 8 / 0 / 0	12.5	623 / 1.7 / 77.9 / 77.9	131 / 15	0.97
DAL	Y	259 / 259 / 0 / 0	9.7	21427 / 59.6 / 82.7 / 82.7	133 / 0	1.03
DLH	N	1 / 1 / 0 / 0	0.0	121 / 0.3 /121.0 /121.0	121 /121	1.51
FIV	N	1 / 1 / 0 / 0	100.0	0 / 0.0 / 0.0 / 0.0	NA / 0	0.00

Figure 17-4: Airborne Holding Carrier Statistics

The following information is displayed in the Carrier Statistics:

Carrier Name: The airline for which the delay data corresponds.

CDM MBR: Indicates if the carrier is a CDM participant.

 # Flights Affected - Total/Non_Exempt/Exempt/CNX:

- **Total:** Gives the total number of flights for the specified time period.
- **Non-Exempt:** The total flights that are Non-Exempt (included) in the program.
- **Exempt:** The total flights that are Exempt (receive no delay) from the program.
- **CNX:** The total flights that are canceled (CNX).

On Time %: Displays the percentage of flights which will arrive within 15 minutes of their ETA.

Delay - Total/Total%/Avg/Aff Avg:

- **Total:** Shows the total minutes of delay for each airline.
- **Total %:** When the total delay minutes for an airline are divided by the total delay minutes for all airlines combined, the resulting value is the percentage of delay attributed to the airline.
- **Avg:** Displays the Average Delay minutes on a carrier's total number of flights.
- **Aff Avg**: Displays the Average Delay minutes for the carrier's flights affected by a program.

Delay - Max/Min:

- **Max:** Gives the values for the maximum delay amounts that a carrier's flights could receive.
- **Min:** Gives the values for the minimum delay amounts that a carrier's flights could receive.

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% Delay / % Traffic: Indicates the delay equity for a carrier at an airport. A value of "1" in this column means that a carrier's delay is perfectly equitable. A value greater than "1" indicates a carrier will receive worse than average delay. A value less than "1" indicates that a carrier will receive less than average delay.

The bottom of the report gives the same statistics for Scheduled/Non-Scheduled flights.

Blanket

The Blanket feature can be used to revise any ground delay program. Before you revise, make sure you have the most current ADL and weather information. From the *Control Panel*, select **ETMS Tools** > *ADL Reques or Weather Request* (see Chapter 14 for more information). The Blanket option is used to add or subtract a fixed number of minutes to or from FAA-imposed delay. Blanket is not to be used in conjunction with GS. This method should only be used if the airport's AAR does not need to be adjusted. Select **Program Type** > *Blanket* from the GDP *Setup* component's General Tab, as shown in Figure 17-5. Each ground-delayed flight has an associated slot time. This IGTA-based slot time is used to determine whether a flight will be included in the *Blanket* operation. The slot time is adjusted by the requested minutes of delay. Should the airline-delayed flight's position be earlier than the new slot time, the airline-delayed flight will be moved to the newly assigned slot time. The open slots due to the delay and cancellation will be moved accordingly.

When the *Blanket* Program option is selected, only the *General* and *Tier/Dist* Tabs are available for entering parameters. The two Tabs are almost identical to other program types with the exception of the additional **Adjust Delay** feature on the *Genera*l Tab.

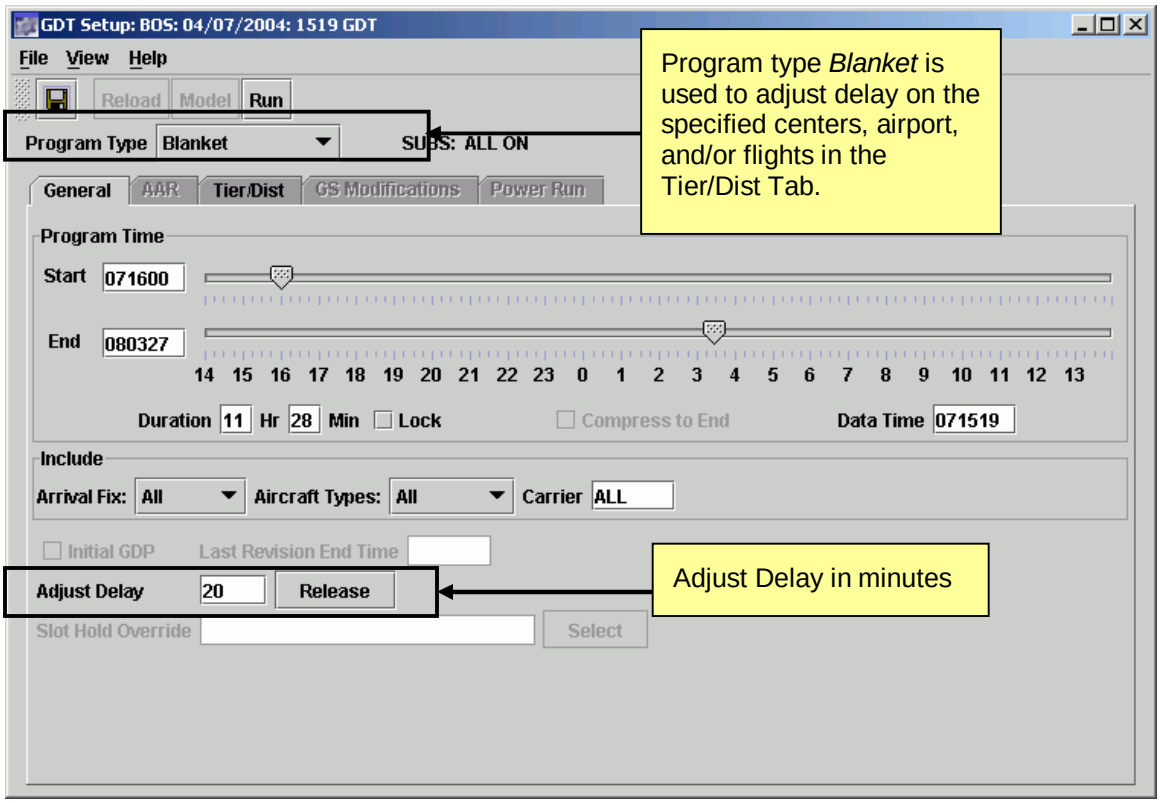

Figure 17-5: Blanket Delay Program Type

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General Tab Modifications

From the General Tab, you can specify several parameters to adjust delay.

1. **Start:** Enter the date and time when the *Blanket* program will begin.
2. **End:** Enter the data and time when the program should end. The default program period last until the ETA of the last CTA flight.
3. **Data Time:** Set the time to be used as the current time. This time can be set forward or back without changing the data.
4. **Aircraft Type:** Chose All, Jet Only, or Prop Only from the drop-down menu to specify the aircraft types included in the program.
5. **Carrier**: Leave "All" to include all carriers at that airport in the program. If you want to only include a single airline, type the carrier's three-letter code into the text box. Please note that you cannot ever include only one carrier without including its sub-carriers. Likewise, you cannot choose to only include a sub-carrier in the program. Typing a carrier code into this field will
6. **Adjust Delay [-999 – 999](min):** You must manually enter a value for delay minutes to add or subtract from flight delay. To reduce delay, enter a negative number into the field. The **Release Delay** button will lift all delay from flights by entering "-999" into this field (see Figure 17-6). Likewise, manually entering "-999" will lift all delay from flights. After the value is entered, the slot time is moved up by that value, with some restrictions:

   - The new slot time can only be moved up to the airline-specified Earliest Runway Time of Arrival. If the Earliest Runway Time of Arrival is not available for this flight, the Original ETA is used for the restriction.
   - The new departure time can only be moved up to the sum of the current time and Exempt Flights Departing Within Data Time + (min) entered in the Setup Panel.

   To add delay to flights, enter a positive value in the Adjust Delay field.

Note: FSM performs an error check on the parameters you set for exempt departure airports and exempt flights. FSM will warn you when the airports/flights do not appear in the ADL to be given exempt status.

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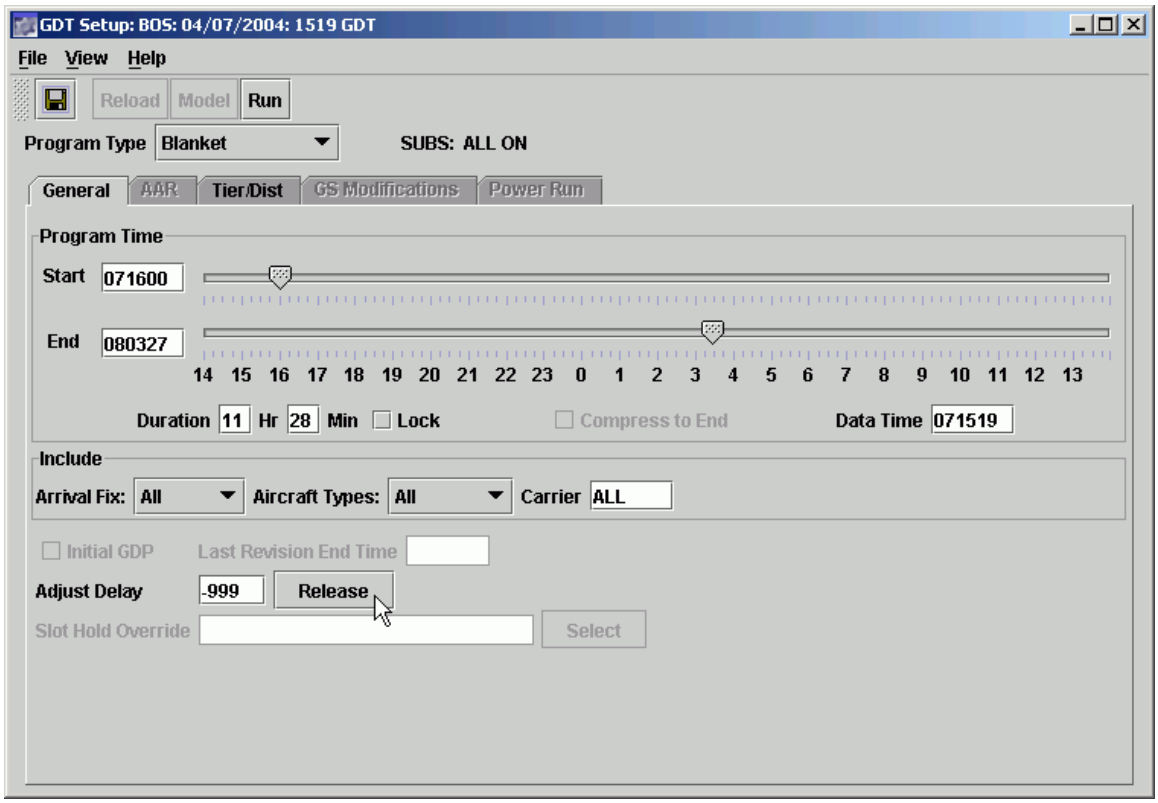

Figure 17-6: Release Delay

Identify the Facilities to Affect – By Tier

Select the centers, airports, and/or flights that you wish to affect.

To model a tier-based *Blanket* program, select the **Exempt by** *Tier* option in the Tier/Dist Tab. The Tier panel contains three sections where parameters can be modified: Centers, Airports, and Flights.

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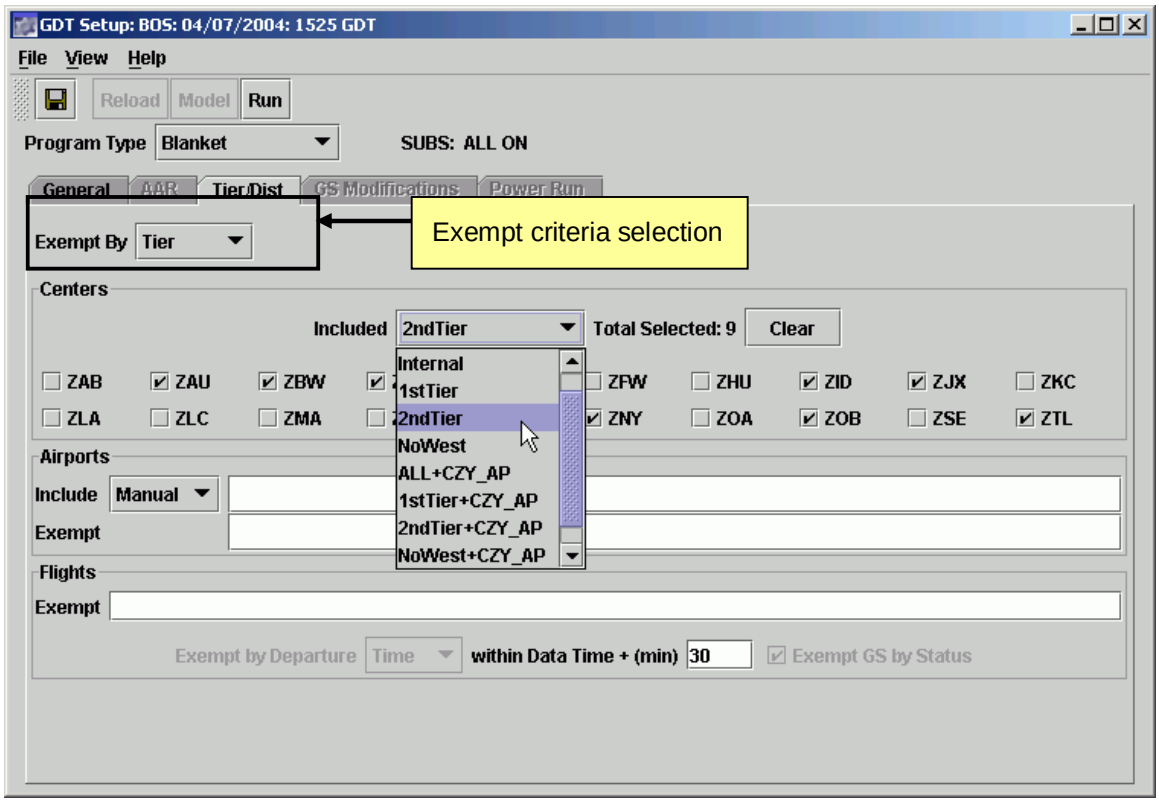

Figure 17-7: Exempt By Tier selected

To identify the Centers who will receive delay, select the appropriate center group keyword from the **Included** dropdown list. Additionally, you can select/unselect individual centers manually, as shown in Figure 17-7.

In the Airports Section, list any airports' three-letter ID that you wish to include in the program that are outside of the center scope you have selected above in the Airports **Include** text field. To exempt an airport that falls within the center scope, list the airport in the Airports **Exempt** text field.

List any flights that should be included in the *Blanket* program delay adjustment.

The *GDT Map* can also be used to include centers or exempt centers and airports from the program. The color red indicates which centers and airports are included in the Initiative. Green airports are exempt from delay. Centers are outlined in blue and have no color when exempt. Clicking on an airport or center will change its status accordingly. Figure 17-8 is an example of a 2nd tier program for BOS airport with airport MSP exempt, and airport STL and BNA included. For more information on how to include/exclude centers and airports using the *GDT Map*, see Chapter 4.

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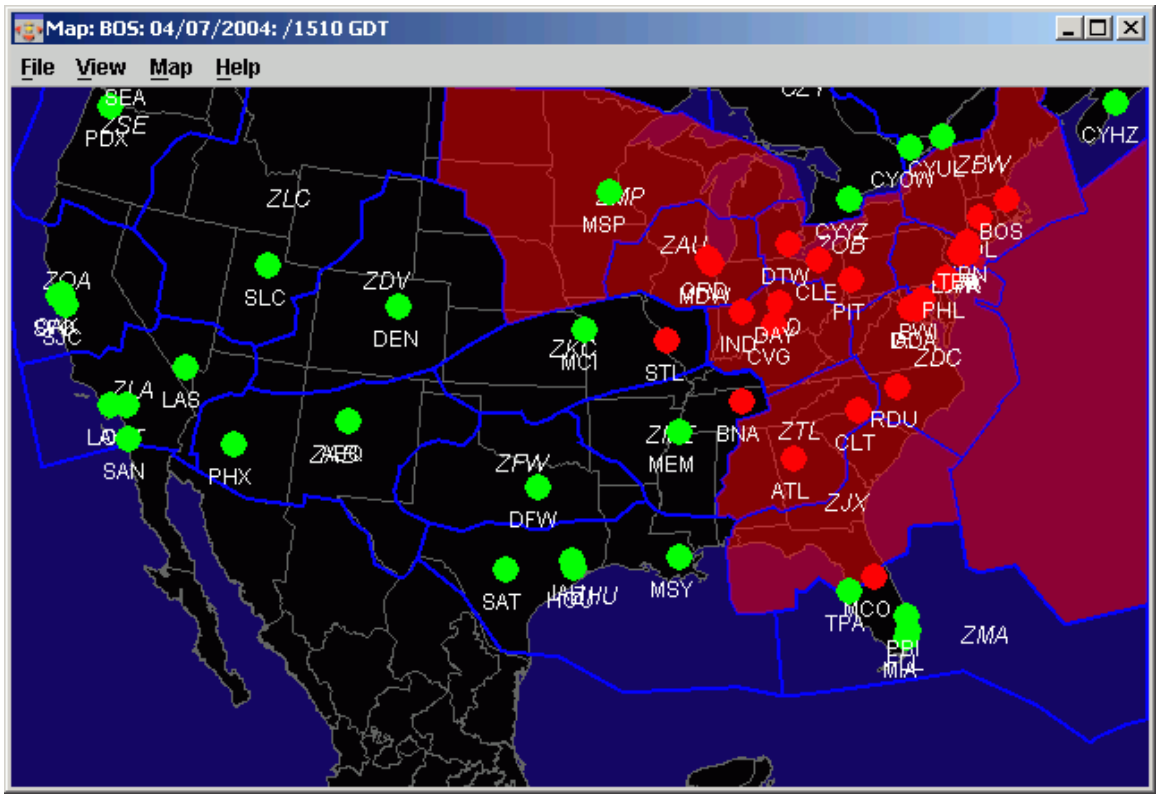

Figure 17-8: 2nd Tier program with airport MSP exempt and BNA, STL included

Any changes made to the Map will be dynamically reflected in the GDT *Setup* component's Tier/Dist Tab. Figure 17-9 shows the Tier setup panel, which reflects the *GDT Map* in Figure 17-8.

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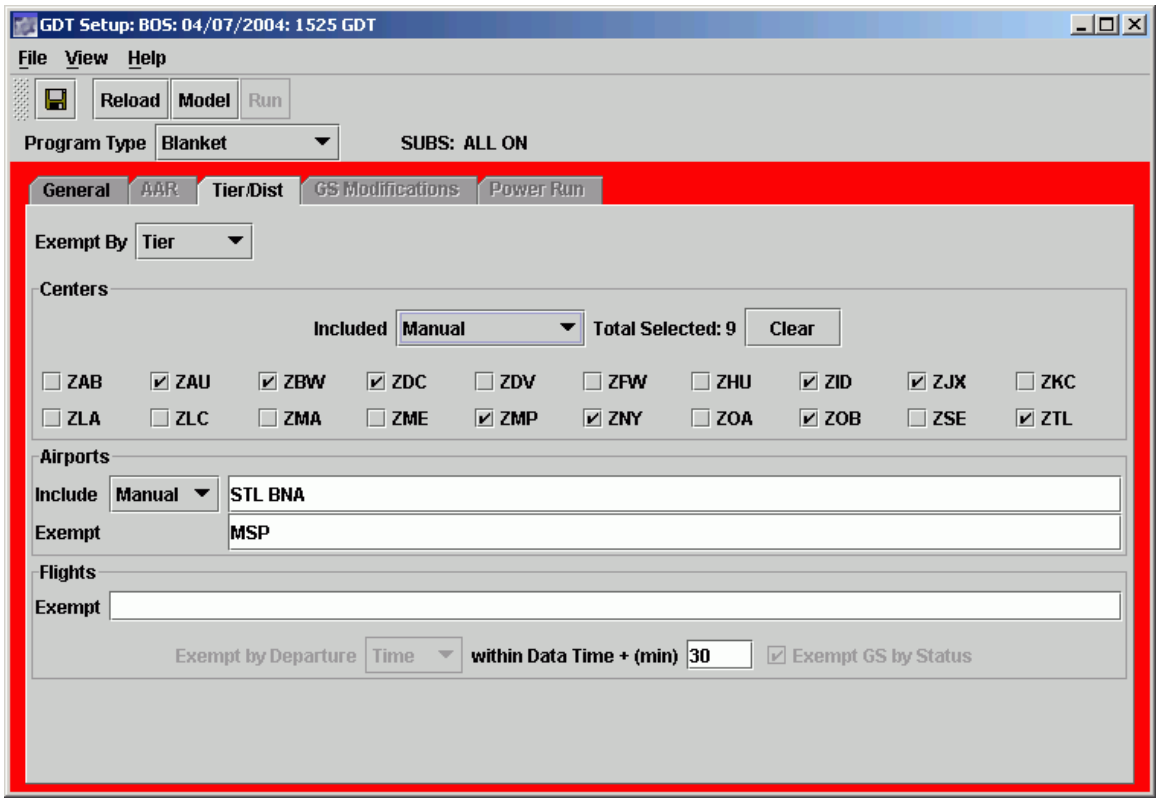

Figure 17-9: Tier/Dist Tab

Identify the Facilities to Affect – By Distance

To model a distance-based *Blanket* program, select the **Exempt by** *Distance* option in the Tier/Dist Tab. The Distance panel contains four sections where parameters can be modified: Distance, Centers, Airports, and Flights.

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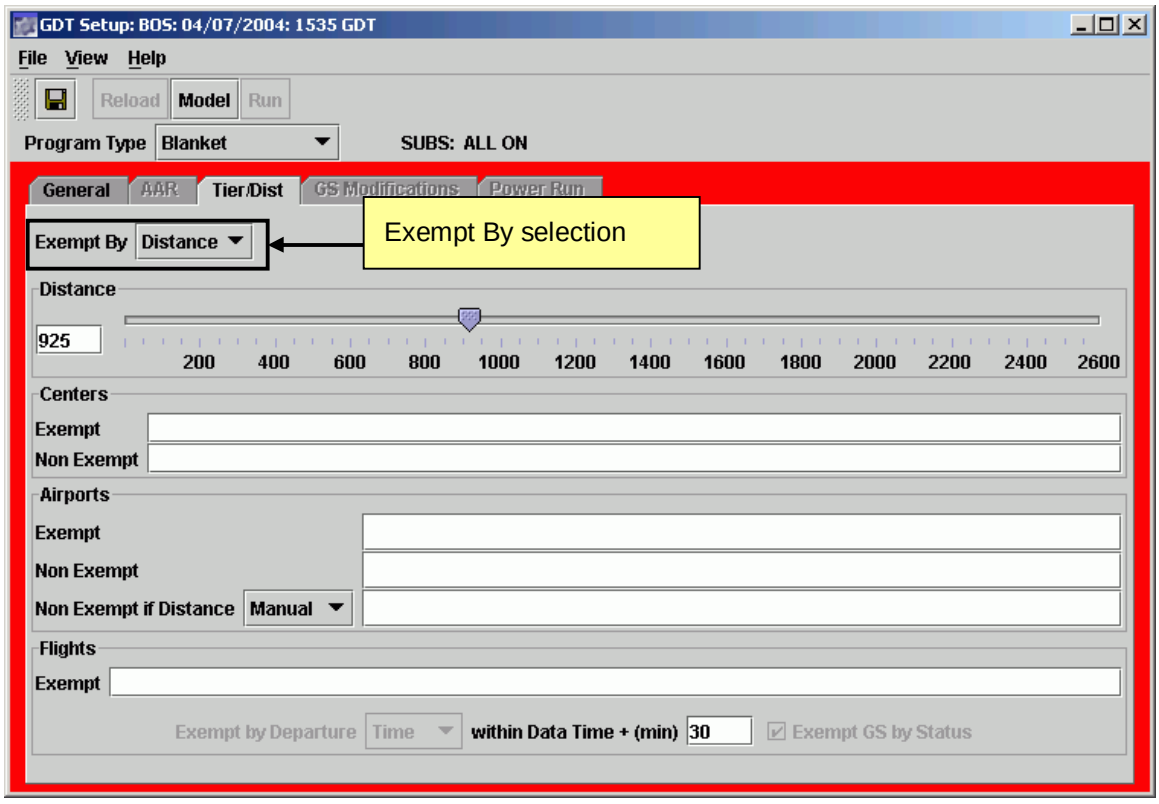

Figure 17-10: Exempt By Distance

The **Exempt By** *Distance* selection is used to identify the facilities involved in the *Blanket* program based on distance. The default distance is set to 200 nautical miles when the distance tab is initially opened. To change the distance, enter your desired distance in the **Distance** textbox or click and drag the sliding bar. To exempt Centers from Adjust Delay that are within the distance range, enter the centers in the **Exempt** text field. To Adjust Delay to centers that are outside the scope of the distance, manually enter the center in the **Non Exempt** text field.

In the Airports Section, list any airports' three-letter ID that you wish to exempt from Adjust Delay in the Airports **Exempt** text field. Alternatively, if you wish to give an airport Adjust Delay that is outside the distance range, enter the airport in the Airports **Non Exempt** text field. To Adjust Delay to Canadian airports, if they fall within the set distance range, enter the Canadian airport in the **Non Exempt if Distance** text field.

Enter a flight's ACID in the Flights **Exempt** text field to Adjust Delay on that flight.

The *GDT Map* can also be used to adjust the distance radius and add exempt/non exempt centers and airports to the program. The color red indicates which airports are included in the Initiative and delay will be adjusted. Green airports will be exempt from the delay adjustment. Centers are outlined in blue and have no color when exempt. To adjust the distance radius, place your cursor over the edge of the circle and drag and drop the circle to adjust the distance. Clicking on an airport or center will change its status accordingly. Figure 17-11 is an example of a distance-based program at 925 nautical miles for BOS. Note that the distance based program is very similar to the 2nd Tier program with manual airport adjustments. The GDT *Setup* in Figure 17-10 reflects the same program. The

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GDT *Map* and GDT *Setup* components dynamically interact. For more information on how to exempt/non-exempt centers and airports using the Map, see Chapter 4.

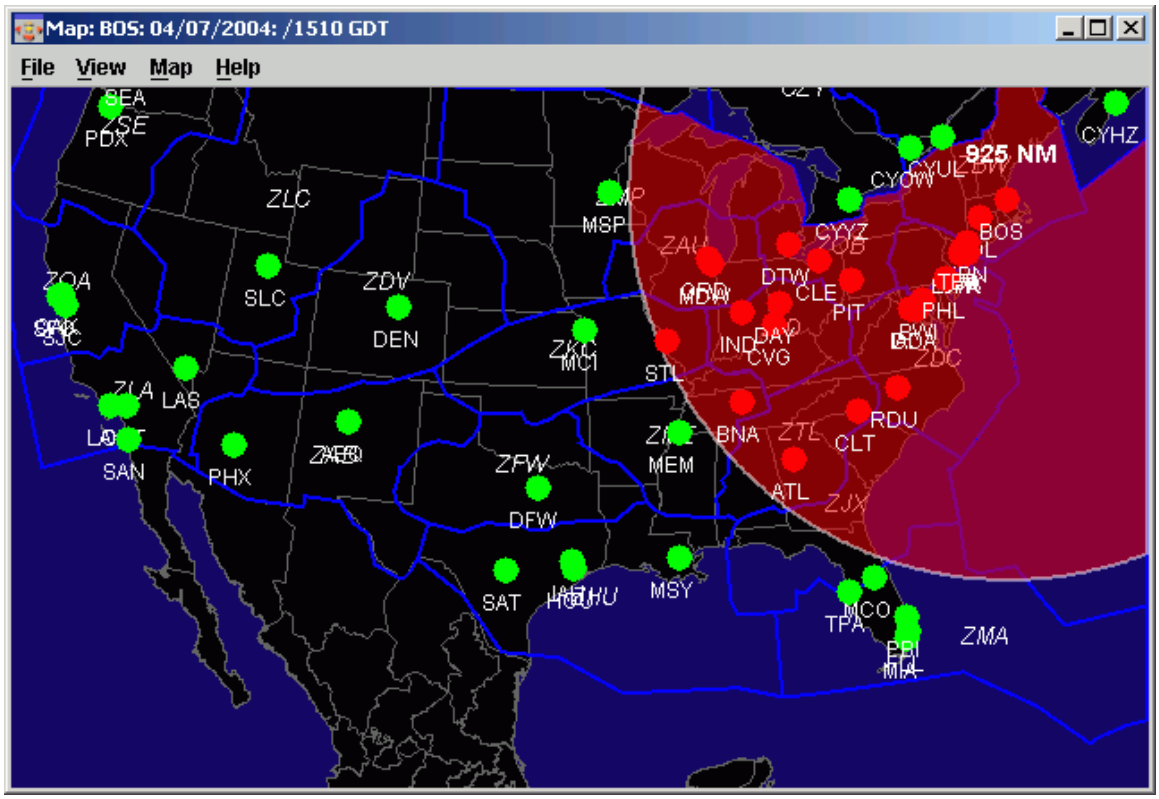

Figure 17-11: GDT Map - Distance Program

Blanket Coversheet

To view the effect that the entered parameters will have on operations; press the **Run** button from the GDT *Setup* component. The **Run** option will bring up the Blanket Coversheet. To view the analysis of the generated Blanket delay select **View** > *Analysis* in the opened Blanket Coversheet window, as shown in Figure 17-12.

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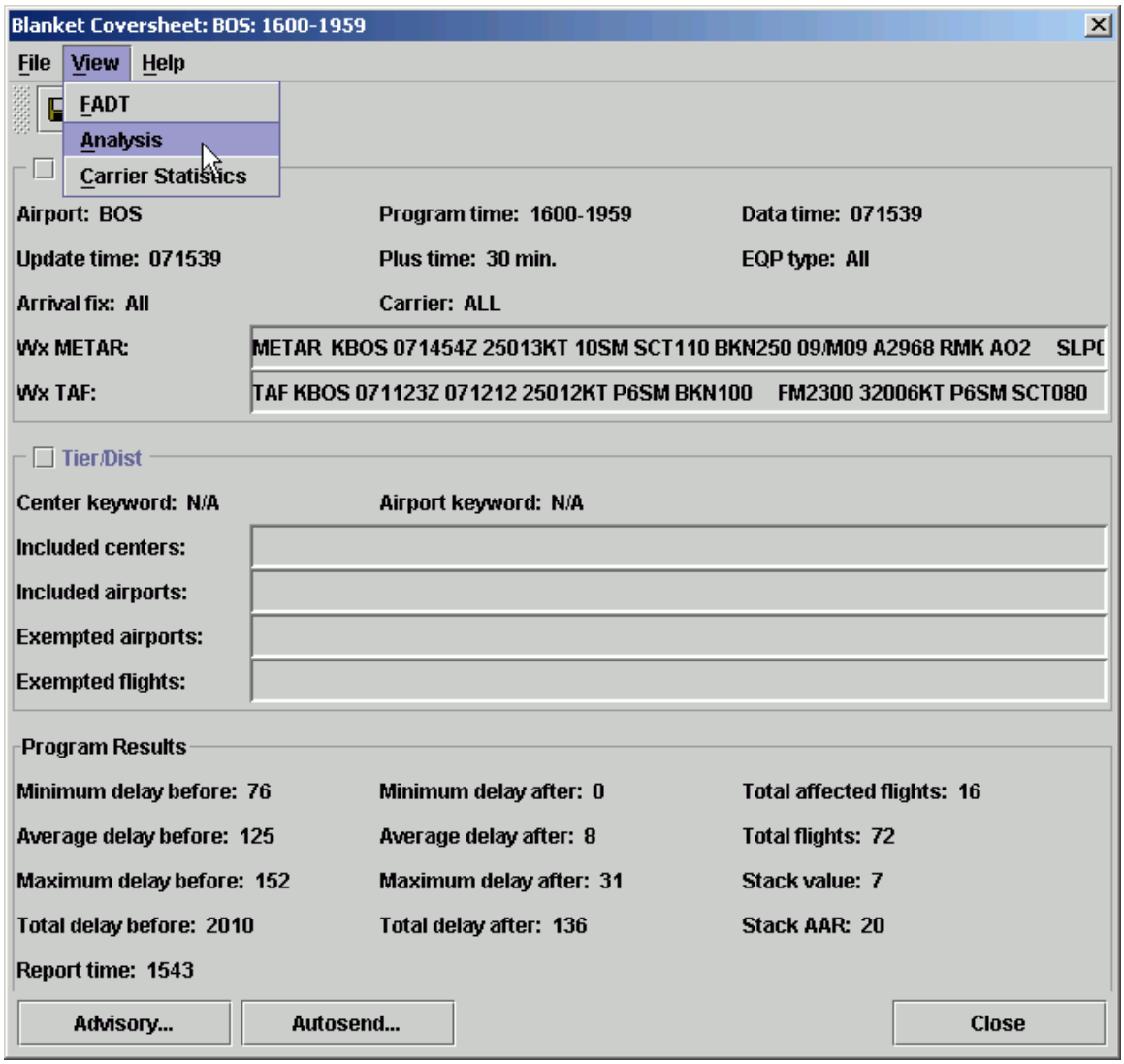

Figure 17-12: Blanket Coversheet

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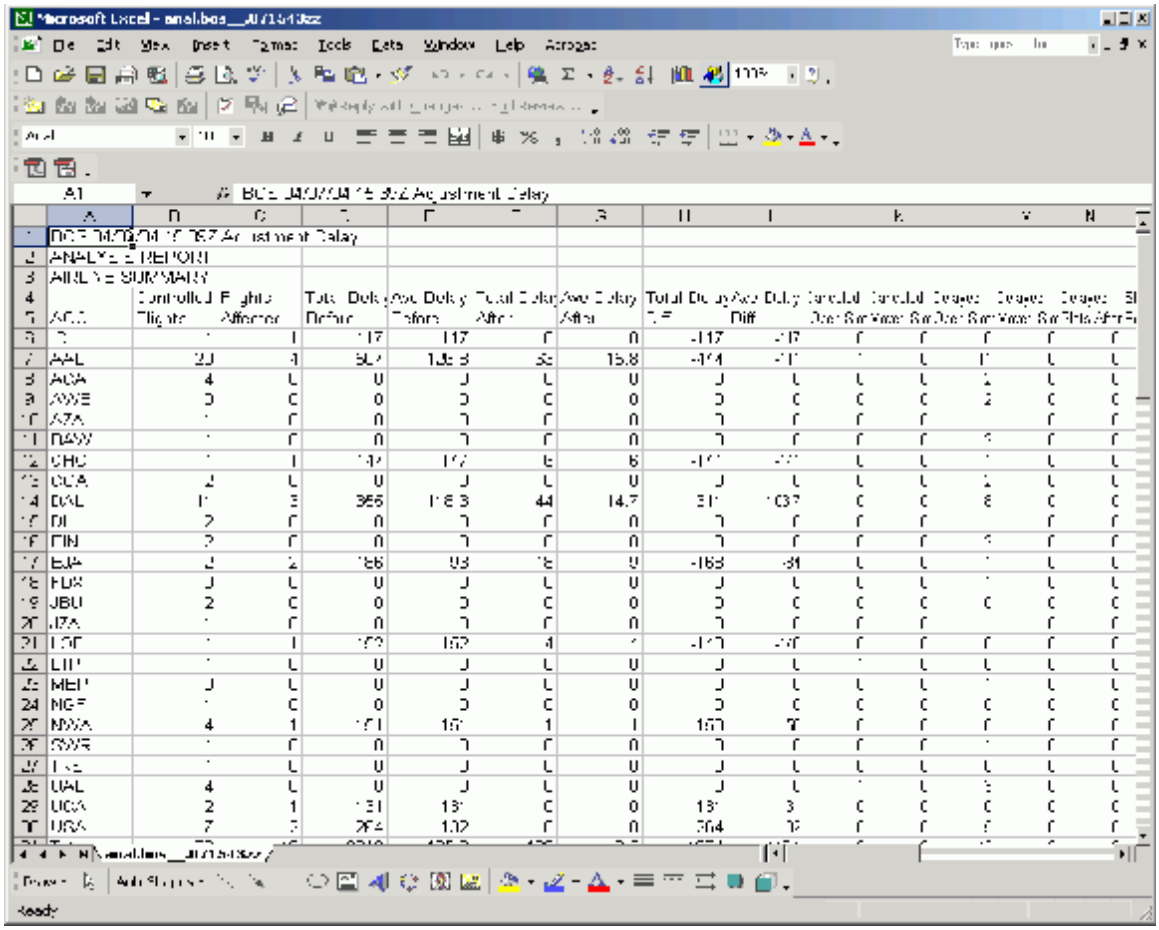

Figure 17-13: Blanket Analysis Report

Sending a Proposed Parameters Advisory

After specifying the *Blanket* parameters and the modeled results are favorable, it is recommended to send out a Proposed Advisory. A Proposed *Blanket* revision is a program being suggested by the FAA, but not immediately implemented. Press **Run** from the *GDT Setup* to open the *Blanket* Coversheet. Review the parameters and then press **Advisory** to open the Blanket Advisory window (see Figure 17-14) Enter the reason for the revision and the time when subs will be turned off in Advisory window Remarks section and make sure that the **Proposed** radio button is selected. Press **Send** to distribute the proposed parameters to all FSM users. A Proposed *Blanket* revision allows NAS users enough time to comment on the proposed parameters even though they may change before an actual program is implemented.

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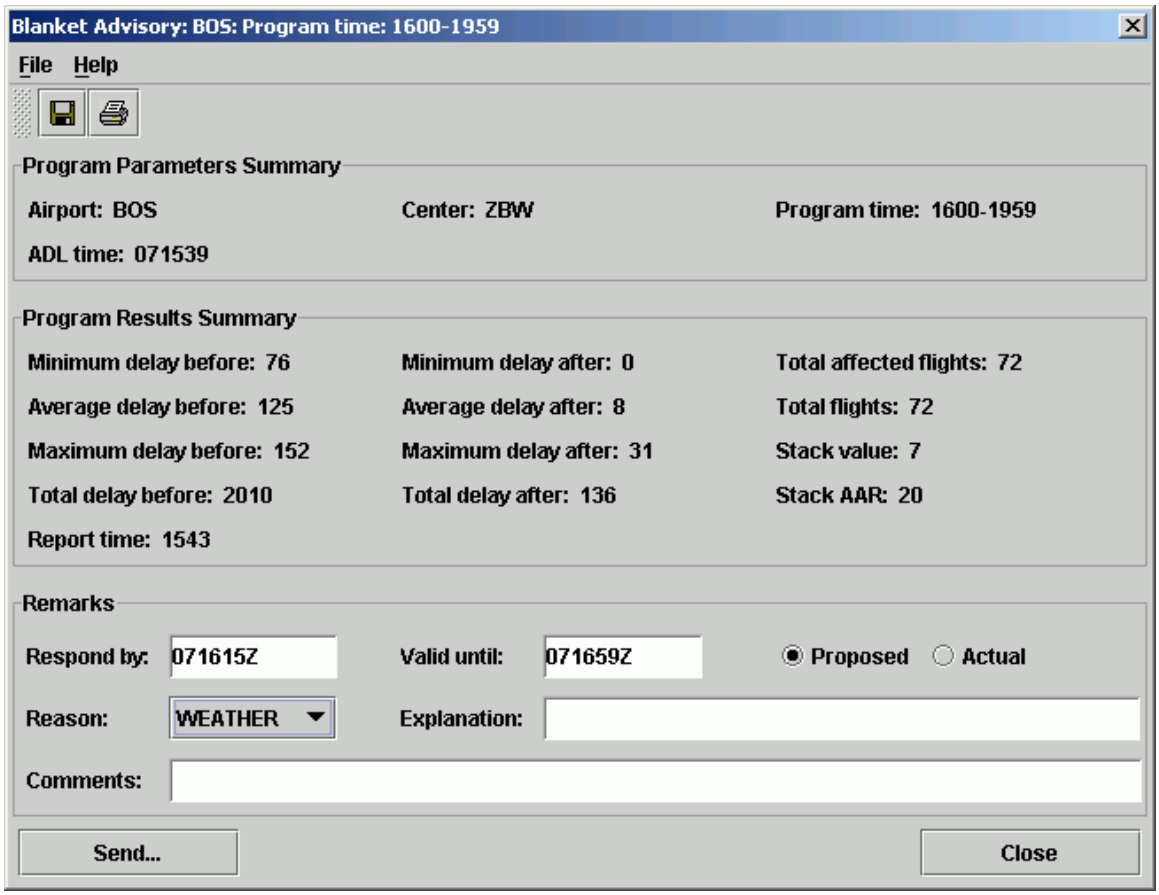

Figure 17-14: Blanket Advisory

Suspend Airline Substitutions and Slot Credit Substitutions

Now you are ready to issue the *Blanket* program but before issuing the *Blanket*, the acceptance of airline substitutions and Slot Credit Substitutions (SCS) messages needs to be temporarily suspended. From the FSM Control Panel, select the **ETMS Tools** > *EDCT Commands* > *EDCT Command* >*EDCT SubOff* sub menu option to turn all substitutions off. Enter the three-character airport ID into the EDCT SubOff dialog box and press **Send** to suspend substitutions for that airport. Airline substitution or SCS messages will no longer be accepted after the Sub Off message is sent to ETMS.

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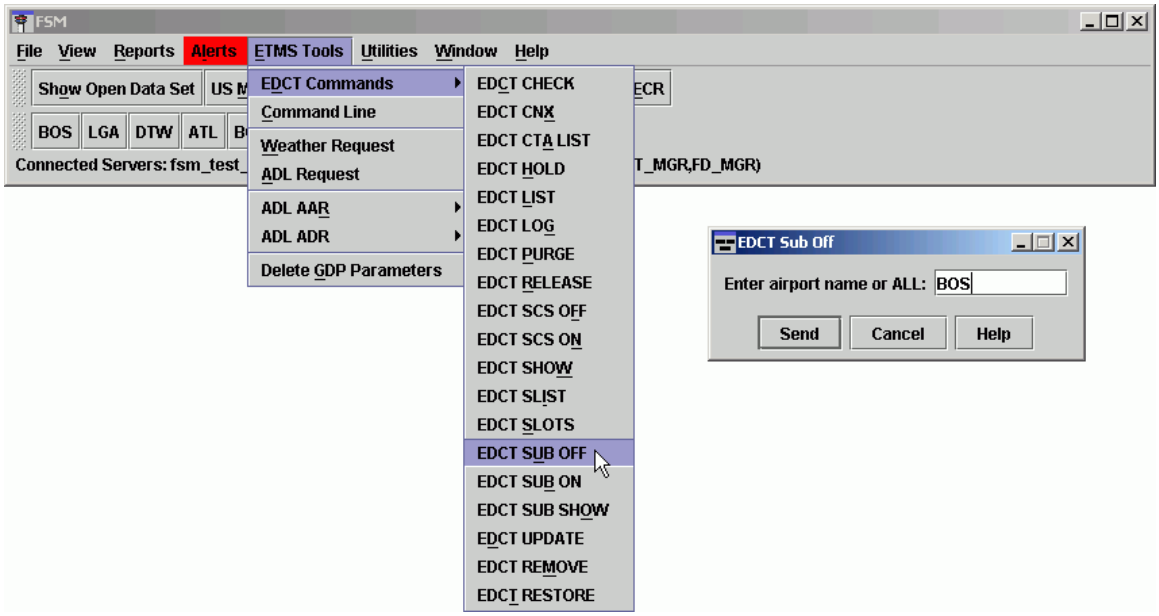

Figure 17-15: Turn Subs OFF and ECDT Sub Off Dialog Box

Issue a Blanket Program

Implementing a *Blanket* program is very similar to sending out a GDP Program or Revising a GDP program. Once you are satisfied with the *Blanket* parameters and substitutions are turned off, there are two steps to enact the program and send the parameters out through the ADL. Program parameters for an Actual program are not sent through the ADL until the Hub site receives both the program parameters (through an Advisory) and a matching FADT list (**Autosend**) with flight control times. Not until both sets of parameters are received will the program parameters and control times be sent through the ADL and the program implemented.

Select **Run** from the GDT *Setup* Component to open the Blanket Coversheet with the revised parameters. Send both the **Advisory** and **Autosend** from the Coversheet to implement the *Blanket* revision. For more information on sending an Advisory and Autosend from the Coversheet, see Chapter 10.

From the Coversheet, click **Autosend** and choose which facilities should receive the *Blanket* program information by selecting one of the following options: ALL, FA Only, EDCT Only, or Cancel. The FA Only option displays a list of ARTCCs, via checkboxes, in which to send the Blanket Program. This option also allows you to select between host or TMU destinations. The EDCT Only option displays a list of ETMS Hubs and ARTCCs, via checkboxes, in which to send the Blanket Program. The ALL option will send the program to all Hubs, ARTCCs and CDM participants. The Cancel option will cancel and close the Autosend selection window..

Program parameters and the EDCT portion of the FADT file are sent to the Hub site when you click **Autosend**. However, the Hub site will not include this information in the incoming ADLs until a matching *Advisory* is sent to the Hub site as well.

To send an Actual Advisory (to match a FADT file sent for an actual program), click **Advisory** from the Coversheet. This brings up the Blanket Advisory window. The

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Proposed radio button is selected by default when the Advisory window is initially opened, therefore you must select the **Actual** radio button. The actual **Blanket Advisory** window requires that the "Valid until" and "Reason" are filled out before sending.

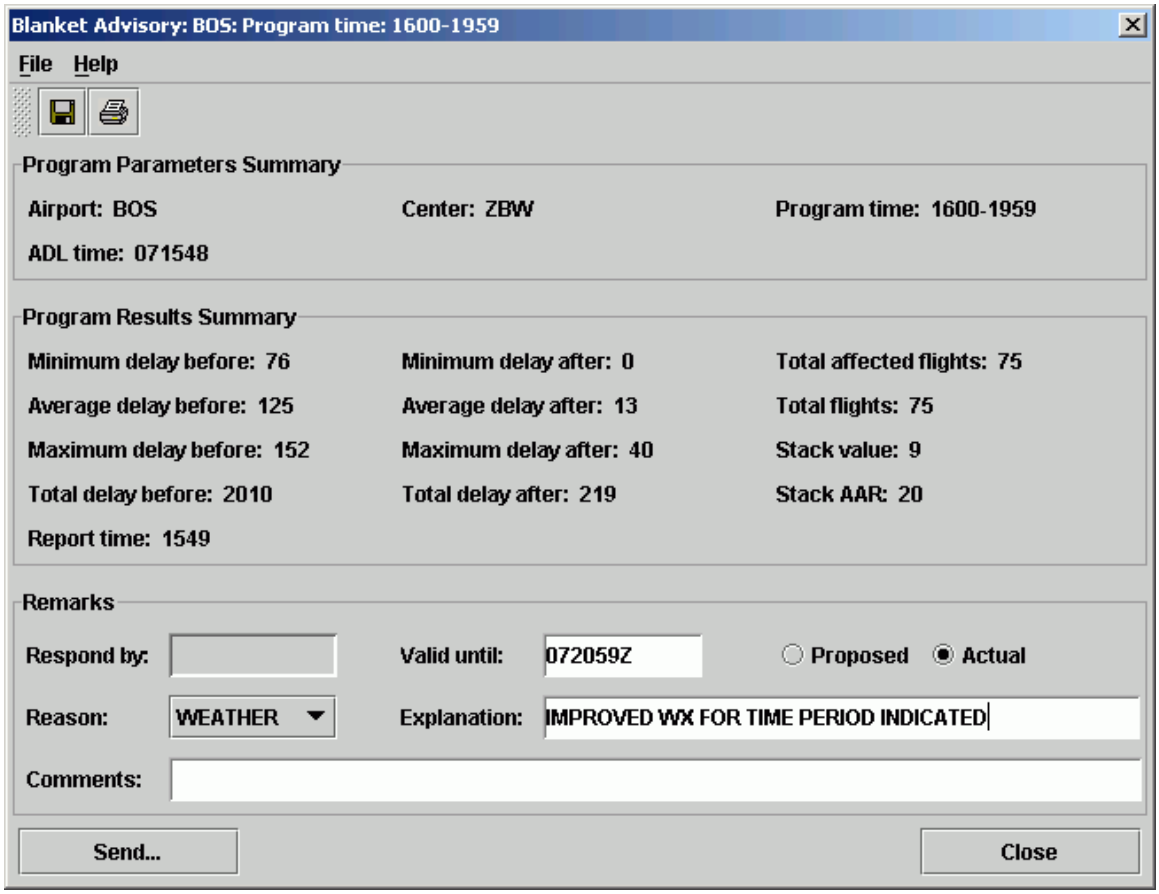

Figure 17-16: Actual Advisory

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18 Issuing a Ground Stop

Unlike ground delay programs, which delay flights because of a reduced AAR, the *GS Immediate*, and *GS Future* function prevents flights from departure until further notice. In FSM, the GDT Setup Component is identical for all Traffic initiatives, with active Tabs differentiating between Program Types. The GS Modifications Tab is active for both types of Ground Stop programs. During a Ground Stop, ETD is checked against the Start Time and End Time to determine whether the flight will be included in the ground stop. (In a GDP, times are checked against a flights ETA). Flights included in the Ground Stop program will be assigned a new ETD; being the first minute after the Ground Stop End Time. The new ETAs will be assigned based on the flights' Original ETE. For example, if the Ground Stop period is 1320-1419, flights with an ETD between 1320 and 1419 will have a new ETD of 1420. The new ETA will be the New ETD + Orig. ETE.

There are two types of Ground Stop programs:

1. **GS Immediate** - GS Immediate issues the Ground Stop Immediately and Exempt By Status should be used during this program type.
2. **GS Future** - Similar to GS Immediate, this Ground Stop is issued for a specific time in the future and Exempt By Time should be used during this program type.

Selecting the Parameters

Open any monitored airport in Ground Delay Tools (GDT) mode by selecting the **GDT Setup** button from the main *Control Panel* component. If an airport was not highlighted when you press the **GDT Setup** button, an FSM error message will indicate "No current data set" selected. When the four GDT components open, select the **Program Type** > *GS Immediate* or *GS Future* from the drop-down menu next to Program Type on the *GDT Setup* component.

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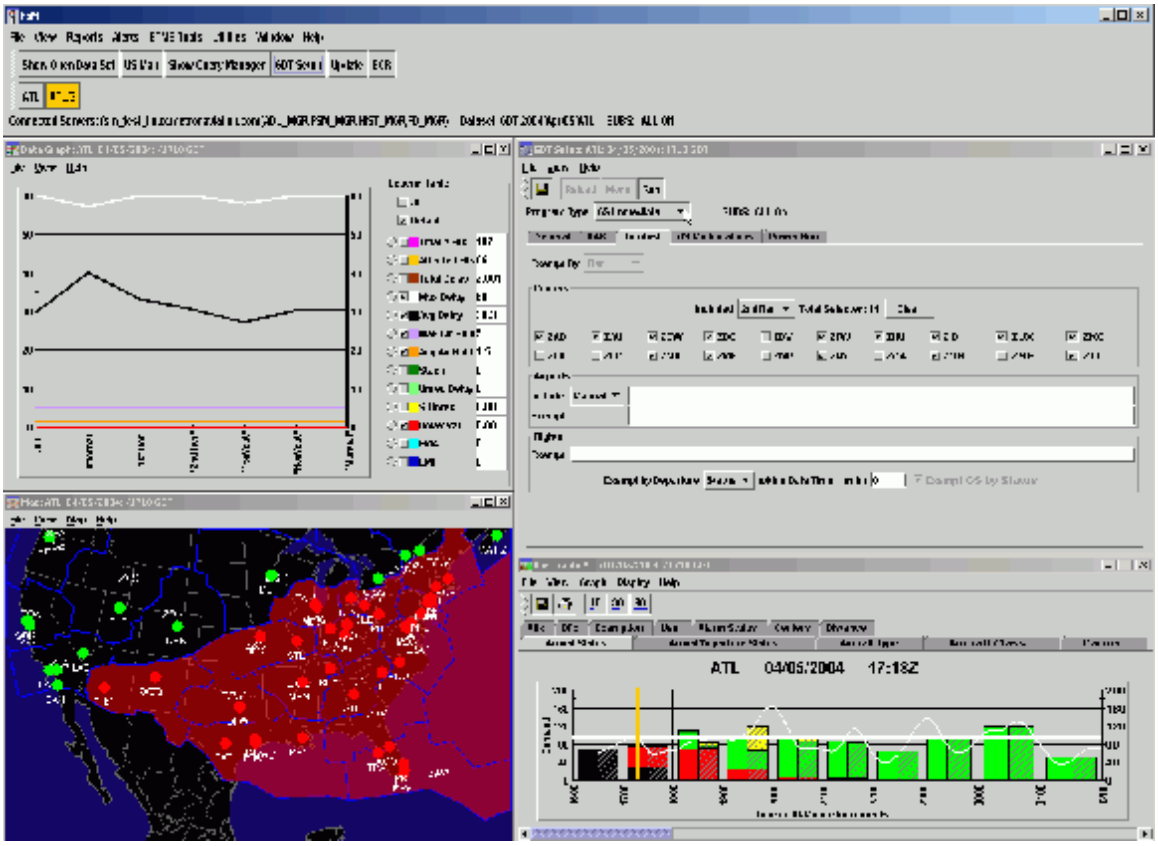

Figure 18-1: GDT Mode Display

Once you select the appropriate Program Type, you are ready to set the necessary parameters through each of the Tab sections of the GDT *Setup* component.

General Tab Parameters

In the General Tab, you can adjust the Program Time, the Arrival Fix, Aircraft Type, and Carrier(s) to be included in the Ground Stop (see Figure 18-1). Adjust the program time by clicking and dragging the pointers on the Start and End time lines or by manually typing a new time (ddhhmm) in the textboxes. If no changes are indicated for Arrival Fix, Aircraft Type, or Carrier, the default is set to include All.

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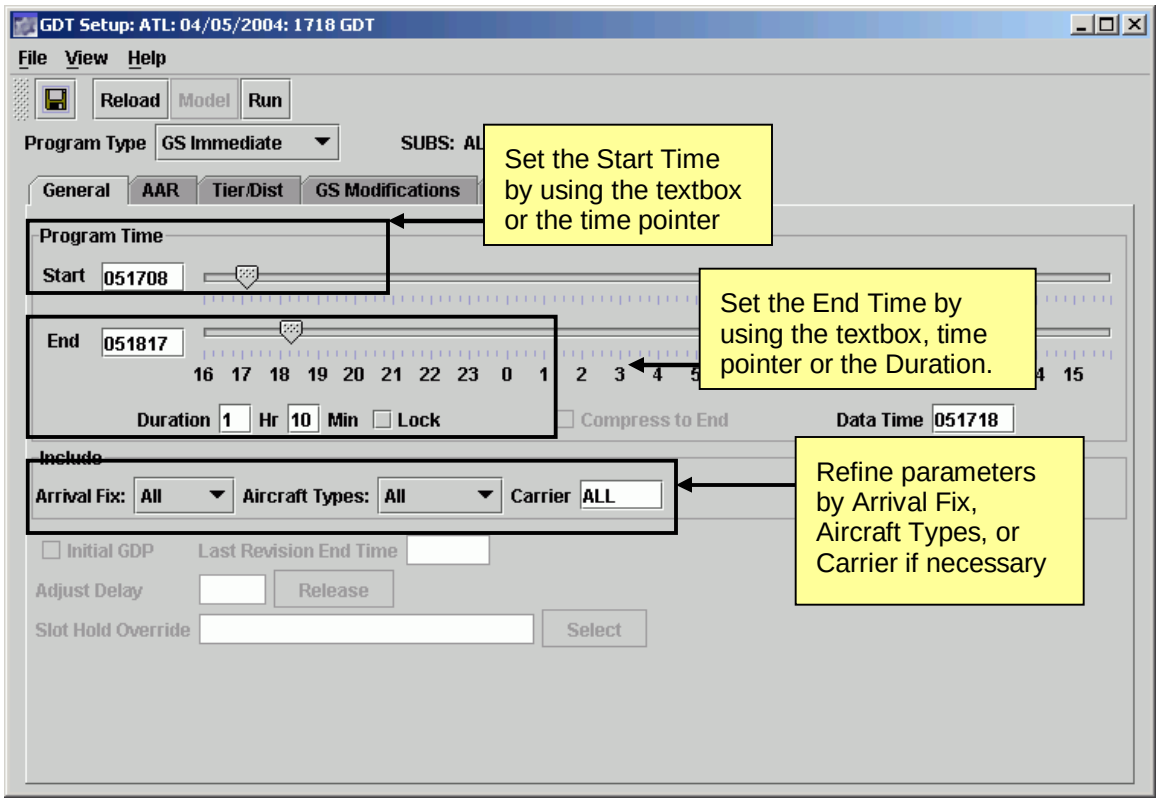

Figure 18-2: GDT Setup General Tab

Program Time

- **Start**: If you have selected **GS Immediate** as the Program Type, the start time will default to the current time minus 10 minutes. So if the current time is 1841Z, the default start time will be 1831Z. If you selected **GS Future** as the time to enact your ground stop, you can enter the date and time when the Ground Stop will begin.
- **End**: The default end time is the current time + 59 minutes. However, you can change the end time regardless of whether you checked **GS Immediate** or **GS Future** as the Program Type.
- **Data Time**: Set the time to be used as the current time. This time can be set forward or back without changing the data.

Include

- **Arrival Fix**: Use the drop-down menu to determine which Arrival Fixes to include in the GS program..
- **Aircraft Types**: Choose All, Jet Only, or Prop Only from the drop-down menu to specify which will be included in the GS program.
- **Carrier**: Leave "All" to include all carriers at that airport in the ground stop. If you want to only include a single airline, type the carrier's three-letter code into the text box. Please note that you cannot include only one carrier without including its sub-carriers. Likewise, you cannot choose to include just a sub-carrier in the ground stop. Typing a

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carrier code into this field will always include a major and sub-carrier in the ground stop program.

AAR Tab Parameters

Under the AAR Tab, select the desired AAR for the airport (see Figure 18-3). While a Ground Stop program is not based on the AAR, this section is available for specialists to view and evaluate whether or not to issue a Ground Stop. Set the target AAR values under this tab to efficiently monitor capacity vs. demand. Clicking **ADL AAR** will restore the AAR values to their original state.

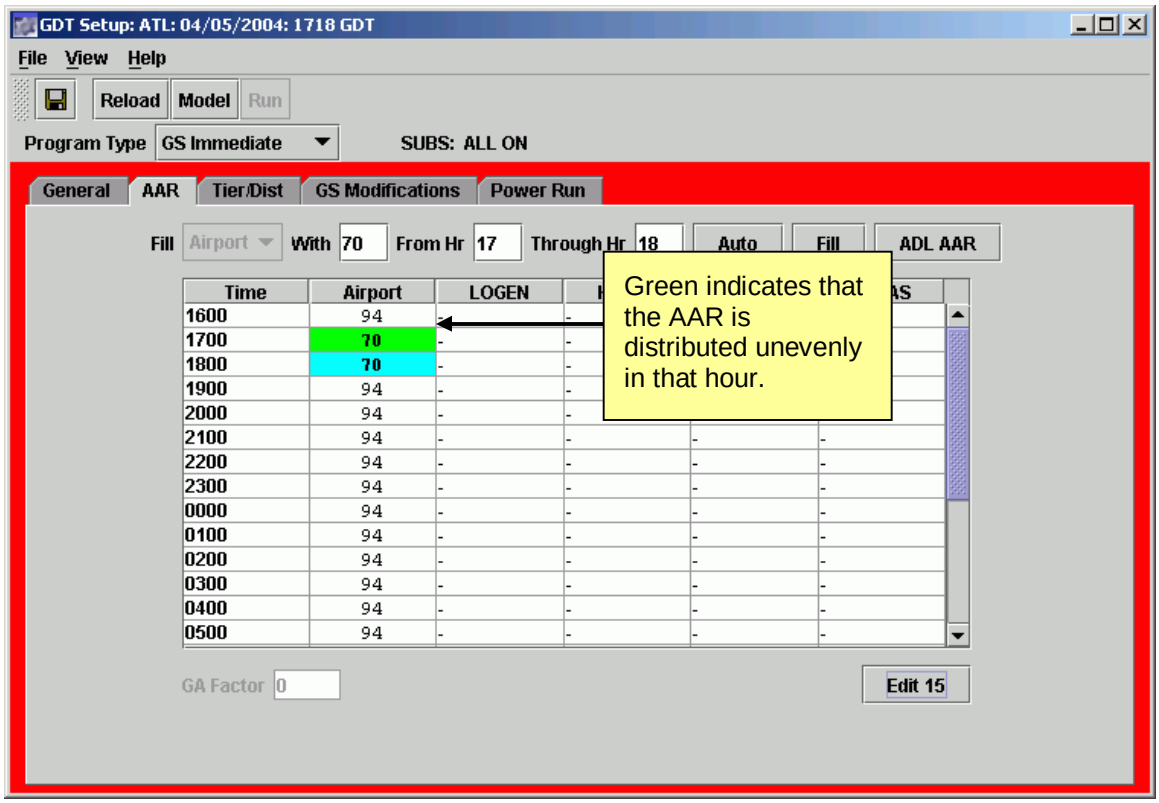

Figure 18-3: GDT Setup AAR Tab

Enter the new AAR rate into the **With** textbox. Enter the hour, in the **From Hr** field when the new AAR should take effect. Likewise, enter the last hour to use the new AAR in the **Through Hr** field or click **Auto** to automatically fill the [From Hr] and [Through Hr] textboxes with the Start and End times that were specified under the General tab. Click **Fill** to automatically fill the hours with the new AAR. You can also type new AAR values directly in the hours that are being changed.

In the example above, a rate of 20 was filled in for the hours of 1300z – 1800z. The rate for individual hours may be adjusted in 15-minute increments. Select the appropriate textbox for the hour and then click **Edit 15** or right-click the textbox you wish to edit to open the *15 Min AAR Dialog box.* For example, Figure 18-4 illustrates an AAR of 20. The first fifteen minutes the airport can not take any flights. But an AAR of 10 is assigned for the last 15-minute time increment. You can assign any value in each 15-minute increment as long as the combined total equals the overall AAR/ADR value for

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that hour. Click **OK** to change the 15-minutes increments for that hour or **Cancel** to close the window without making any changes.

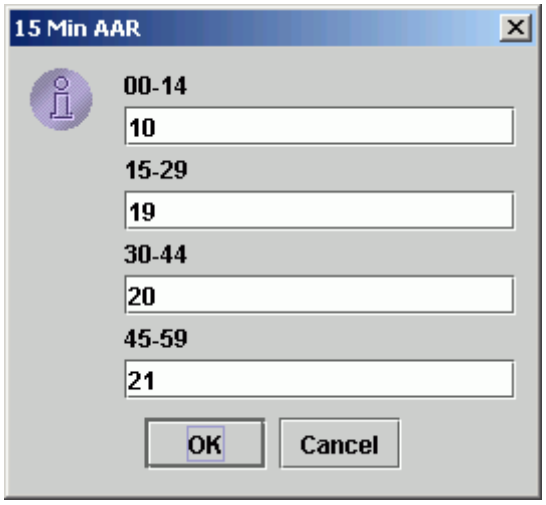

Figure 18-4: 15 Min AAR Dialog Box

Depending on the AARs you assign within an hour, the background color will change for that hour's AAR. **Green** indicates that the AAR is distributed unevenly among the 15-minute increments in that hour. **Blue** indicates that the 15-minute AARs do not differ from each other by more than a value of "1." **White** indicates that the AAR for that hour is the same as the ADL AAR. **Red** indicates that the AAR is more than twice the value of the default AAR.

Tier/Dist Tab

Click on the Tier/Dist Tab to select the facilities and airports included in the Ground Stop. Ground Stops are always Tier based; therefore Distance is not valid exemption criteria. The Tier panel contains three sections where parameters can be modified: Centers, Airports, and Flights, as shown in Figure 18-5.

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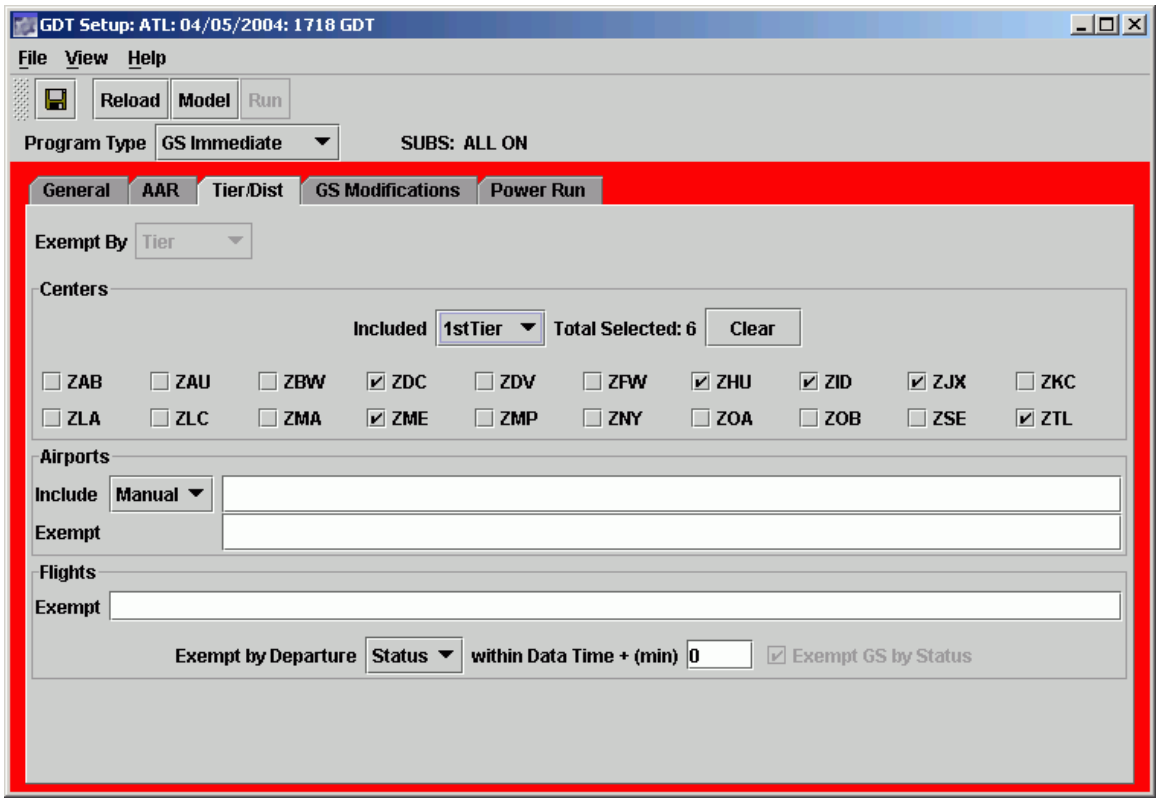

Figure 18-5: GDT Setup GS Tier/Dist Tab

Centers: You can manually select the centers to include in the program or select a Tier level from the **Included** drop down menu.

- **Included:** Select a tier option from the drop-down menu. Selecting a Tier will automatically select the corresponding centers. The total number of centers is displayed to the right of the Tier selection. Click **Clear** to erase all the center checkmarks and return to the Included tier selection back to Manual.
- **Manual Center Selection:** Click on the checkbox to select or unselect individual centers for the program.

Airports: This section of the panel allows you to include and/or exempt airports.

- **Include:** You may choose to include certain departure airports from the Ground stop that were not included based on the initial Center selection criteria. Enter the three or four-letter airport code to include an airport. Separate airports with a space or a comma.
- **Exempt:** You may choose to exempt certain departure airports from the Ground Stop. Enter the three or four-letter airport code to exempt that airport. Separate airports with a space or a comma.

Note: FSM performs an error check of the parameters you set for exempt departure airports and exempt flights. FSM will warn you when the airports/flights do not appear in the ADL to be given exempt status.

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Flights: This section of the panel allows you to exempt/exclude priority flights from the Ground Stop, and to choose to exempt by Status or by Time.

- **Exempt:** Choose specific flights to exempt from the Ground Stop by entering the flight's call sign. Separate flights with either a space or a comma.
- **Departure Time/Status:** To exempt flights based on their Departure Time or Departure Status, click the drop-down menu and select an option. To exempt flights based on departure time, enter a value in the within Data Time + (min) text field. The value should equal the number of minutes relative to the data time to exempt flights departing within that time. For example, to exempt flights departing within 20 minutes of the current time, enter 20 next to Data Time + (min). The default value is 45. If you base your exemptions on Departure Status, you do not need to fill out any further parameters in this field.

Note: *GS Immediate* should be based on Departure **Status** and *GS Future* should be based on **Time**.

GS Modifications Tab

Using the GS Modifications Tab you can specify additional centers or airports to run in the ground stop (see Figure 18-6). Note that the ground stop parameters set in this field can have a ground stop start and stop time that differs from the main ground stop. All other parameters in the ground stop program remain the same. The text added to this field can be edited or deleted.

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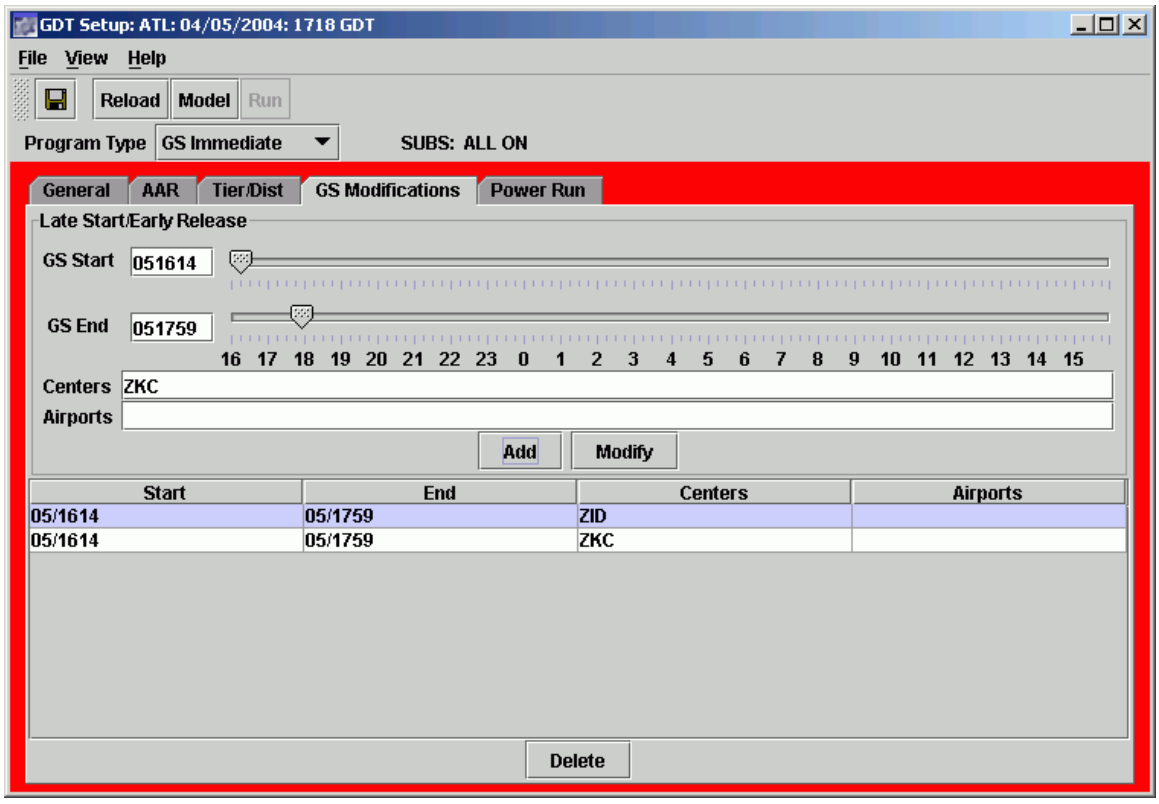

Figure 18-6: GDT Setup GS Modifications Tab

GS Modifications Parameters

- **GS Start and GS End:** For the selected Centers /Airports, you can set time parameters that differ from the main ground stop. All other parameters in the ground stop remain the same.
- **Centers:** You can add additional center(s) to run a ground stop. Enter the three or four-letter center name and then press Add. Separate centers with a space or a comma.
- **Airports:** You can add additional airports to run a ground stop. Enter the 3 or 4-letter airport code and then press Add. Separate airports with a space or a comma.

After the GS Modification parameters are entered, click **Add** to add the parameters to the program. The modification will be listed in the table. To change an existing modification, highlight the modification line from the table. This will enter the parameters in the textboxes where you can adjust the information and press **Modify** to change it. To remove a modification from the table, highlight the modification line and press **Delete**.

Power Run Tab

Before actually running the Ground Stop, you may want to review the parameters you set to make sure they are optimal for your program. This allows you to take advantage of several analysis tools embedded in FSM

The Power Run Tab in the GDT Setup component is used as an analysis tool. There are three GS Power Run operations, which analyze the effects/results of any program: *GS*

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Center Group, *GS Time Period*, and *GS Center Group & Time Period.* These options can be selected from the drop down menu that appears next to **Power Run By**. The Power Run function is used to determine whether the parameters need to be modified. When any Power Run is generated, FSM automatically saves the Power Run to a file.

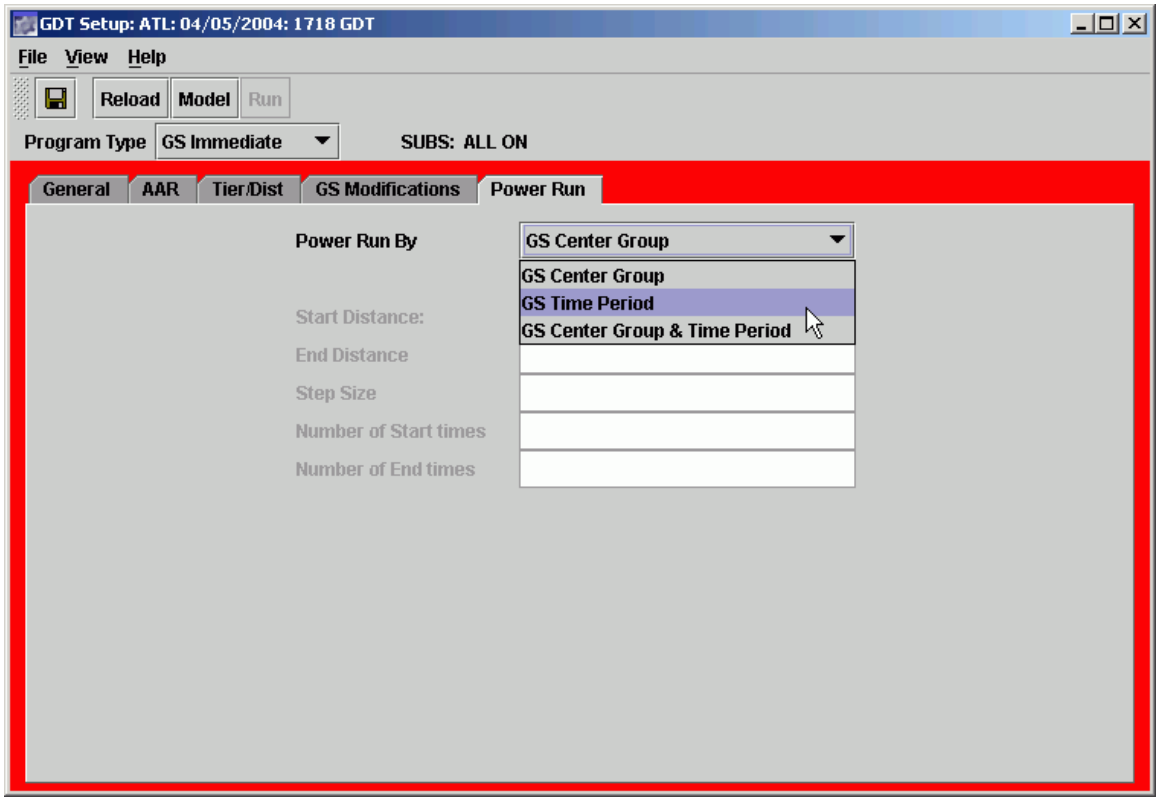

Figure 18-7: GDT Setup GS Power Run Tab

To view a scenario, select an option from the **Power Run By** drop down menu and press **Model**. Model displays the effects of the Ground Stop parameters and how traffic at the airport would be affected if used for an actual program in all GDT components. Review the program statistics in the Data Graph. To preview the effects of a Power Run scenario, move the black line on the Data Graph component to other options displayed on the x-axis. This is discussed in more detail below in the Data Graph Component Section. To view the same information in the table format, select **View** > *Data Table* from the GDT Setup component.

> **Note:** After the **Model** button has been pressed, the Setup Panel no longer contains a red border; this indicates that all components reflect the information in the GDT Setup Panel.

Power Run Options

The different **Power Run By** options describe what data will be reflected on the X-axis of the Data Graph or the Headers of the Data Graph.

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- **GS Center Group**: This Power run allows you to see different statistics for all center groups. The Data Graph's x-axis and the Data Table's column header display the various center groups (see Figure 18-8 & Figure 18-9).
- **GS Time Period**: This Power run allows you to see statistics for different Time Periods. You can specify the number of Time Periods by entering a number in the **Number of Start times** and **Number of End times** textboxes on the Power Run Tab. The Data Graph's x-axis and the Data Table's column headers display the various Time Periods.
- **GS Center Group & Time Period:** This function allows you to see which combination of center groups and time periods of the ground stop parameters will produce the best result. The Data Graph's x-axis and the Data Table's column headers display the various Time Periods and Center Groups combinations.

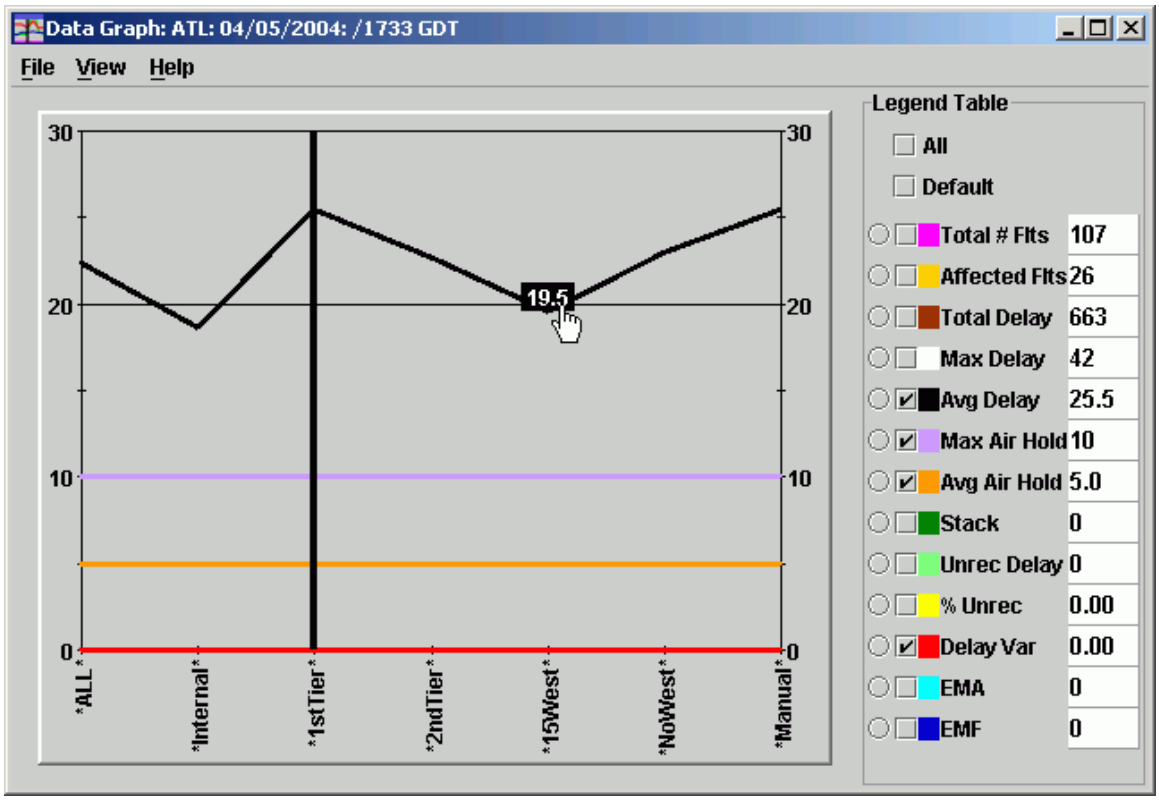

Figure 18-8: Power Run Data Graph by GS Center Group

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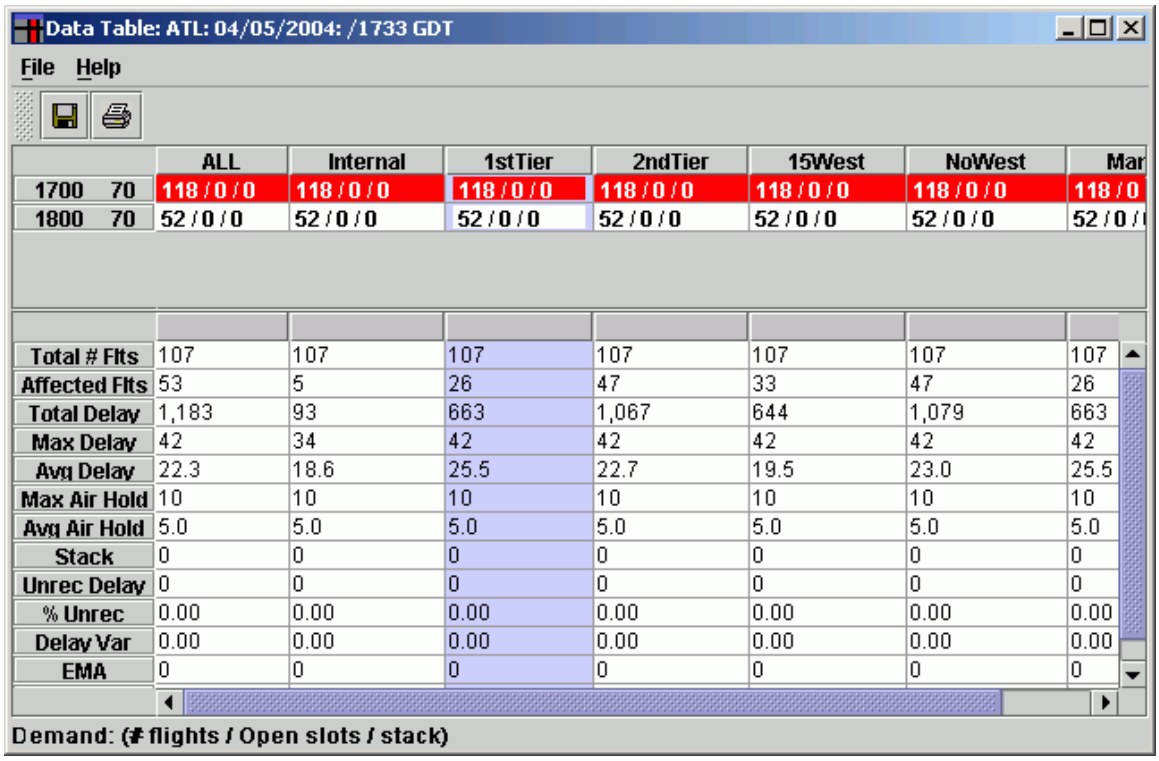

Figure 18-9: Power Run Data Table by GS Center Group

Viewing Controlled Flights

To monitor controlled flights, view the *Bar Graph* and *Time Line* in Live mode. You can identify Ground Stopped flights by looking for yellow flights in the *Bar Graph* and the *Time Line* (see Figure 18-1). In the *Bar Graph*, move the cursor over the yellow bar and a pop-up will appear indicating the number of GS controlled flights in that hour.

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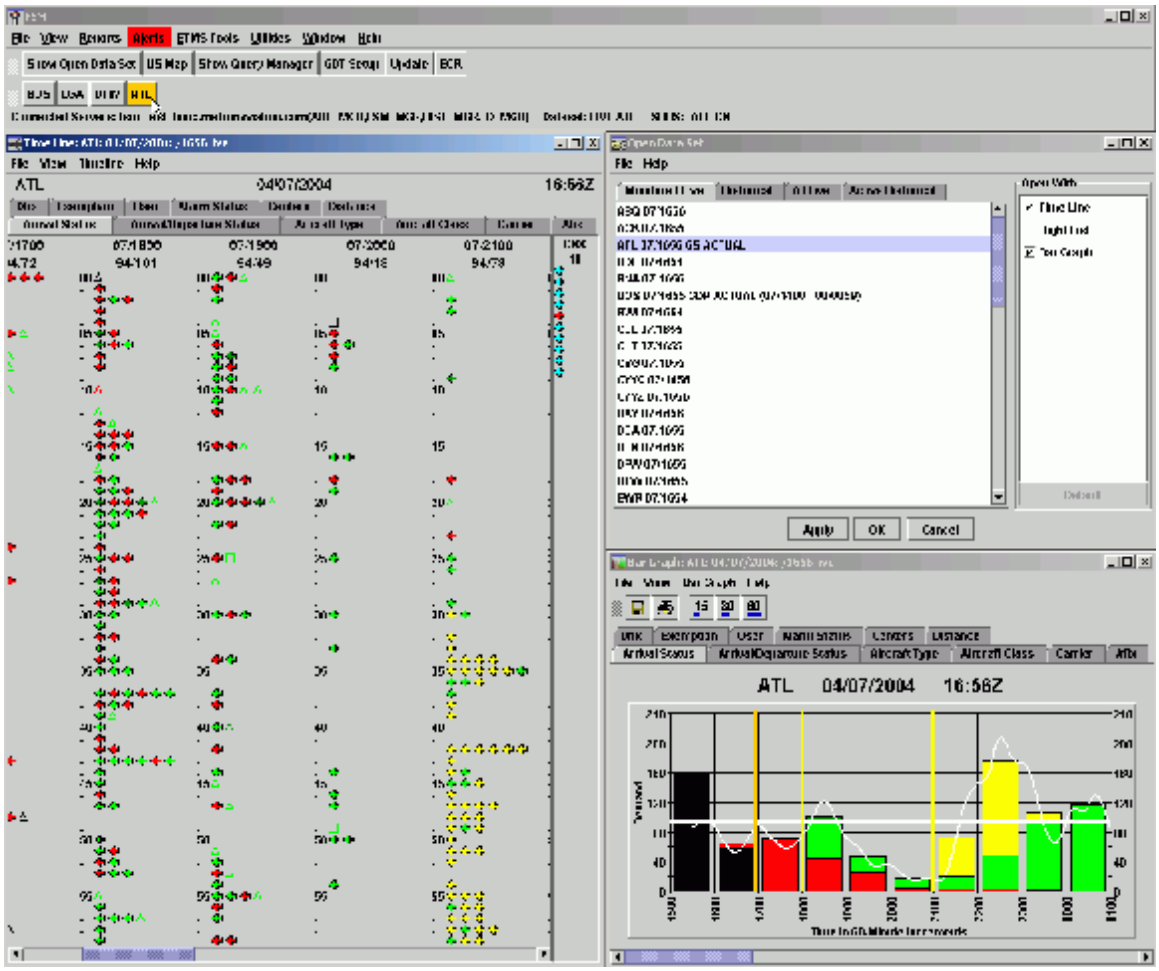

Figure 18-10: Live Mode

You can open a Flight List directly from the *Bar Graph* in any data mode by double clicking on the hour bar. When all colors are displayed on the Bar Graph, the Flight List will contain all flights, both Ground Stopped and other flights. Check the **View** > *Show Legend* checkbox or press CTRL + L to open the color legend. Uncheck all color options with the exception of yellow Ground Stopped Flights. Then click on the hour bar that only has Ground Stopped flights displayed; this will open a Flight List containing only Ground Stopped flights.

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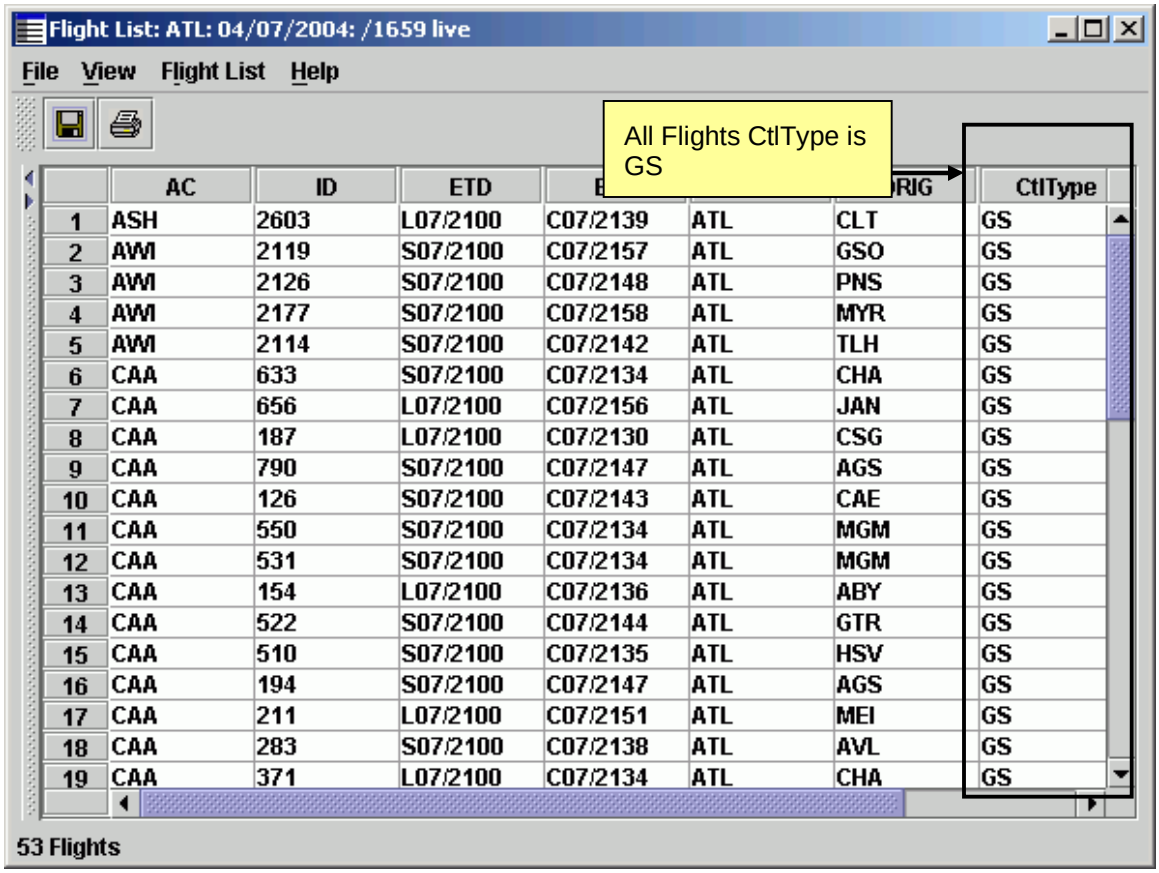

	AC	ID	ETD	E		RIG	CtlType
1	ASH	2603	L07/2100	C07/2139	ATL	CLT	GS
2	AWI	2119	S07/2100	C07/2157	ATL	GSO	GS
3	AWI	2126	S07/2100	C07/2148	ATL	PNS	GS
4	AWI	2177	S07/2100	C07/2158	ATL	MYR	GS
5	AWI	2114	S07/2100	C07/2142	ATL	TLH	GS
6	CAA	633	S07/2100	C07/2134	ATL	CHA	GS
7	CAA	656	L07/2100	C07/2156	ATL	JAN	GS
8	CAA	187	L07/2100	C07/2130	ATL	CSG	GS
9	CAA	790	S07/2100	C07/2147	ATL	AGS	GS
10	CAA	126	S07/2100	C07/2143	ATL	CAE	GS
11	CAA	550	S07/2100	C07/2134	ATL	MGM	GS
12	CAA	531	S07/2100	C07/2134	ATL	MGM	GS
13	CAA	154	L07/2100	C07/2136	ATL	ABY	GS
14	CAA	522	S07/2100	C07/2144	ATL	GTR	GS
15	CAA	510	S07/2100	C07/2135	ATL	HSV	GS
16	CAA	194	S07/2100	C07/2147	ATL	AGS	GS
17	CAA	211	L07/2100	C07/2151	ATL	MEI	GS
18	CAA	283	S07/2100	C07/2138	ATL	AVL	GS
19	CAA	371	L07/2100	C07/2134	ATL	CHA	GS

Figure 18-11: GS Flight list for 1 Hour Bar

Choosing Flight List Information

There are certain default values of Flight List information. When a Flight List is first opened, the default information will be displayed. This default information is adjustable. The following is the FSM default settings, which if not changed in the configuration file will appear in the Flight List when opened.

- **ACID** – The air carrier (AC) and aircraft identification number (ID). This is a three letter carrier code followed by the flight's identification number. For example, UAL1234 indicates United Airlines flight number 1234. Airline users will only see their own carrier and sub-carriers ACIDs; all other flights are masked.
- **ETD** – The flight's Estimated Time of Departure
- **ETA** – The flight's Estimated Time of Arrival
- **DEST** – The airport from which the flight is arriving
- **ORIG** – The airport at which the flight is departing.
- **ARTA** – Actual Runway Time of Arrival
- **ARTD** – Actual Runway time of Departure
- **ARTA – ARTD** – Actual Runway time of Arrival minus Actual Runway time of Departure. This gives an accurate calculation of the flights ETE.

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To choose additional information, such as CtlType, or remove information from an existing Flight List, click **View** > *Select Data Columns* from the Flight List menu. The **Column Settings** window appears displaying all possible informational categories that can be displayed in an FSM Flight List. The categories correspond to the available data fields in the ADL.

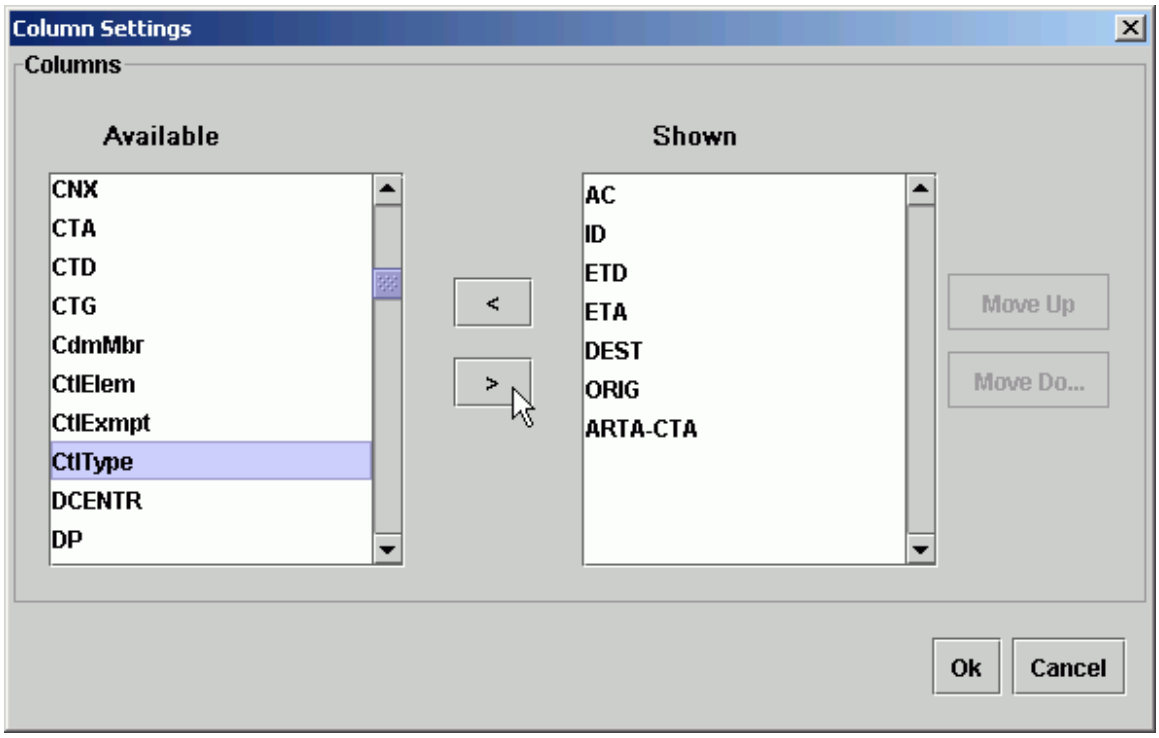

Figure 18-12: Flight List Column Settings Window

To select a category, select a data field under the *Available* window box and click the right arrow button or double click to move the category under the *Shown* window box, as shown in Figure 18-12. All data fields in the *Shown* window box will be displayed in the Flight List. To remove a data field, double-click the data field or highlight the data field and press the left arrow button to move it back to the Available window box. Besides adding/removing data fields from a Flight List, there are two ways to arrange the order in which the data fields are displayed. You can highlight a data field in the *Shown* window box and use the **Move Up** or **Move Down** buttons to move the data field(s) or you can drag and drop columns directly from the Flight list. Once the data field(s) have been selected in the Columns Setting window, click OK and the new data field(s) will appear in the Flight List. See Chapter 6 for more information on Format, Sorting, and Grouping a Flight List.

Viewing Individual Ground Stopped Flights

Flight Information Window

There are three ways to access the **Flight Info** window for a particular Ground Stopped flight:

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1. From the Time Line, right-click any yellow flight icon and select *view flight info* from the pop-up menu.
2. From any Flight List, right-click any GS flight and select *view flight info* from the pop-up menu.
3. From the Control Panel, select **Utilities** > *Search By Callsign* and enter in the call sign of the GS flight.

Each method described above pens the **Flight Info** window for the single flight, as shown in Figure 18-13 .

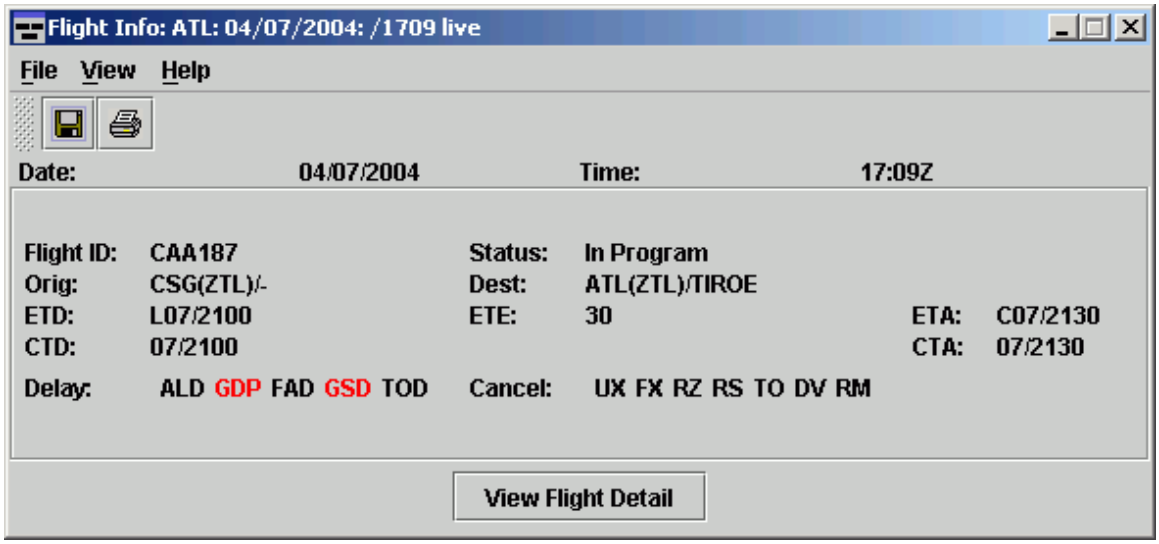

Figure 18-13: Flight Info Window

Flight Details Window

There are four ways to access the **Flight Detail** window for any Ground Stopped flight:

1. From the Time Line component, right-click any yellow icon and select *View Flight Details* from the pop-up menu.
2. From any Flight List, right-click any flight and select *View Flight Details* from the pop-up menu.
3. From the Flight Info window, select the **View Flight Detail** button.
4. From the Flight Info window, select **File** > *Open Flight Detail.*

Any of the methods listed above opens the **Flight Detail** window shown in Figure 18-14.

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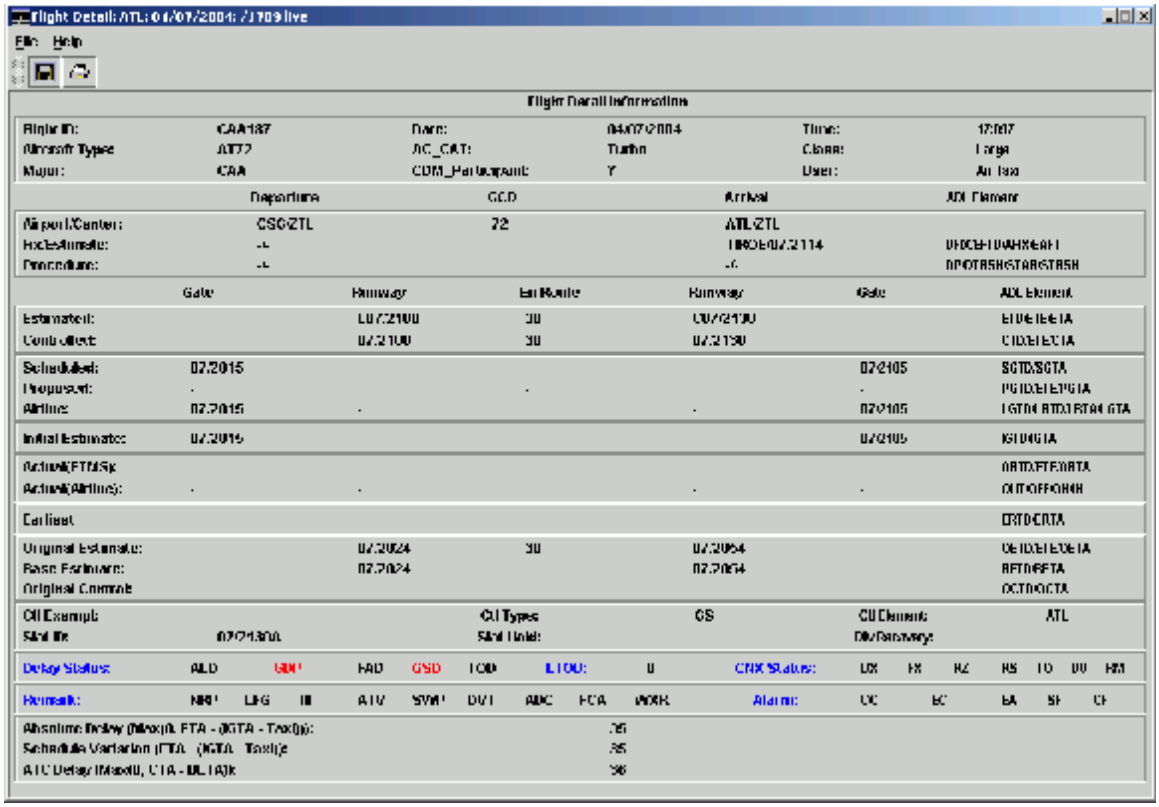

Figure 18-14: Flight Details Window

Query Manager Flight List

Access the *Query Manager* component by selecting the **Show Query Manager** button or quick keys CTRL + Q from the *Control Panel* component. When you wish to see flights that meet certain criteria, a Flight List can be generated from the Show Query Manager component. Select any one of the *Built-in or User-defined Filters* then press the Flight List button or select **View** > *Flight List* from the Query Manager menu.

> **Note:** If you do not have a data set (airport) selected, FSM displays a "No Active Data Sets" error message.

The generated Flight List will contain only those flights that meet the selected criteria. The Query Manager already contains a built-in filter for Ground Stopped flights. To get a list of Ground Stopped flights at any open airport, select the *AND Ground_Stopped* Filter and then click **Flight List** or **View** > *Flight List* from the Query Manager.

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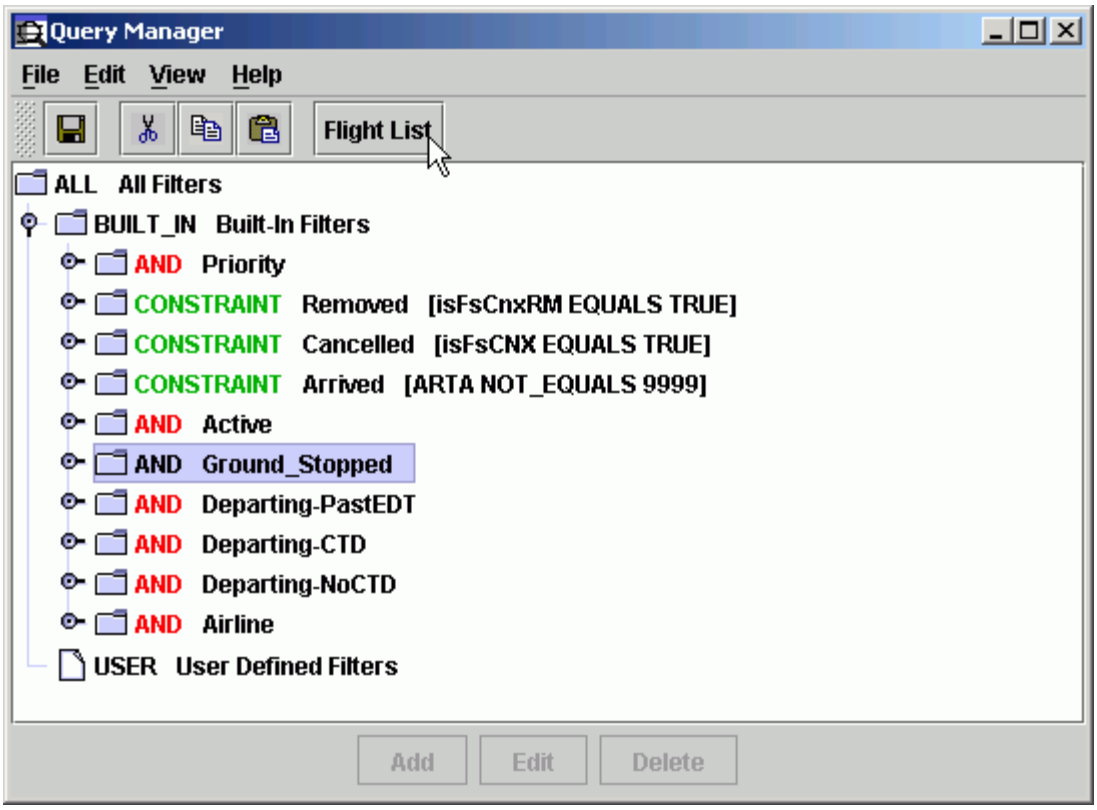

Figure 18-15: Query Manager Component

When there is more than one airport being monitored, pressing **Flight List** opens the *Set Data Set* window, displaying all open airports. Select the Data Mode/airport and click **OK** to view that airport's Ground Stopped Flight List (see Figure 18-16). Click **Cancel** to exit the *Set Data Set* window without opening a Flight List.

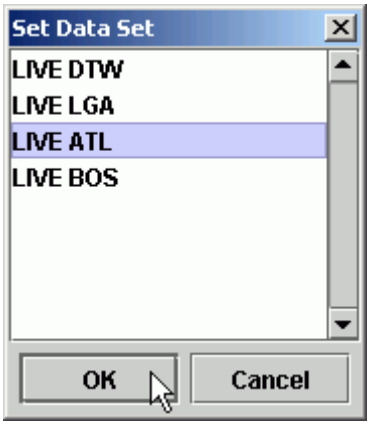

Figure 18-16: Set Data Set Selection window

Opening a Flight List from the *Query Manger* will list all the flights that are Ground Stopped at the specified airport unless otherwise defined by a customized CONSTRAINT, whereas accessing a Flight List from the *Bar Graph* only displays a list of flights for the selected hour. For more information on how to utilize the *Query Manager* component, see Chapter 3.

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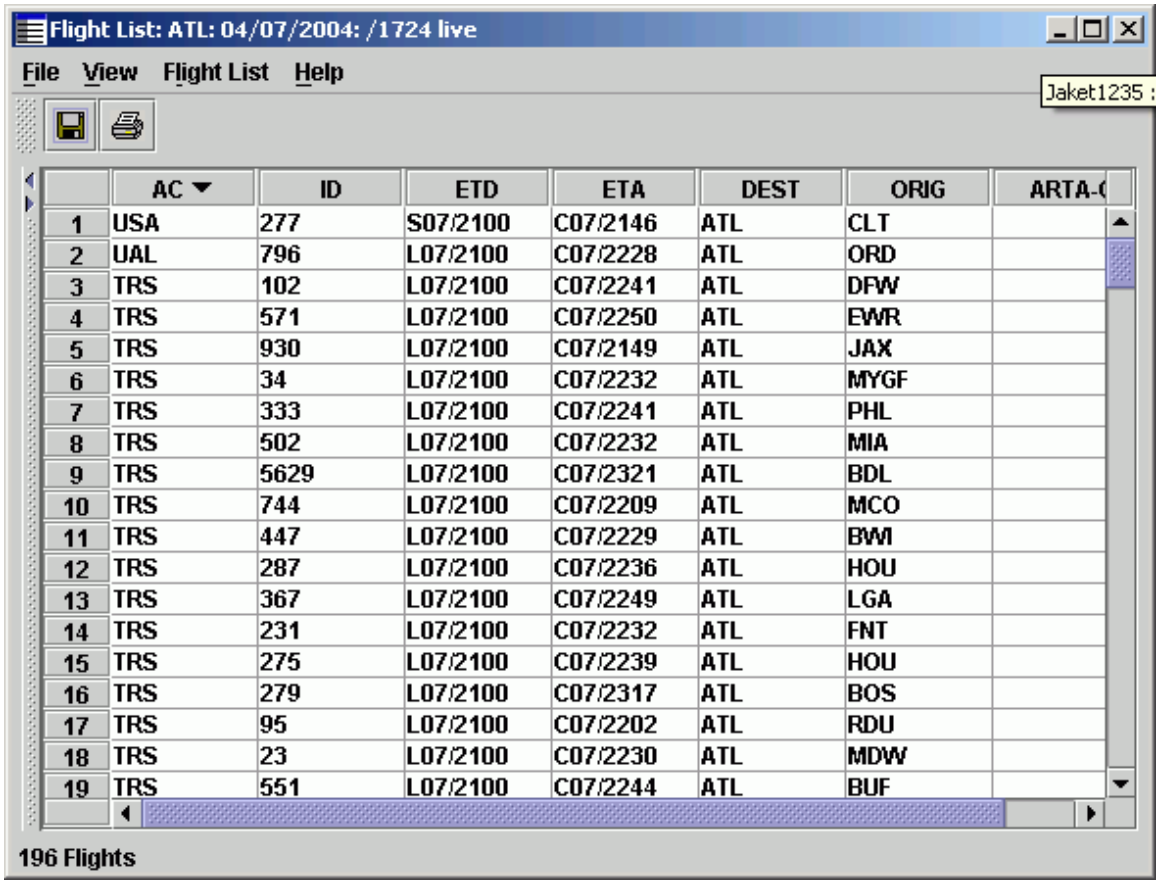

	AC	ID	ETD	ETA	DEST	ORIG	ARTA-(
1	USA	277	S07/2100	C07/2146	ATL	CLT	
2	UAL	796	L07/2100	C07/2228	ATL	ORD	
3	TRS	102	L07/2100	C07/2241	ATL	DFW	
4	TRS	571	L07/2100	C07/2250	ATL	EWR	
5	TRS	930	L07/2100	C07/2149	ATL	JAX	
6	TRS	34	L07/2100	C07/2232	ATL	MYGF	
7	TRS	333	L07/2100	C07/2241	ATL	PHL	
8	TRS	502	L07/2100	C07/2232	ATL	MIA	
9	TRS	5629	L07/2100	C07/2321	ATL	BDL	
10	TRS	744	L07/2100	C07/2209	ATL	MCO	
11	TRS	447	L07/2100	C07/2229	ATL	BWI	
12	TRS	287	L07/2100	C07/2236	ATL	HOU	
13	TRS	367	L07/2100	C07/2249	ATL	LGA	
14	TRS	231	L07/2100	C07/2232	ATL	FNT	
15	TRS	275	L07/2100	C07/2239	ATL	HOU	
16	TRS	279	L07/2100	C07/2317	ATL	BOS	
17	TRS	95	L07/2100	C07/2202	ATL	RDU	
18	TRS	23	L07/2100	C07/2230	ATL	MDW	
19	TRS	551	L07/2100	C07/2244	ATL	BUF	

Figure 18-17: Query Manager Flight List

Run to Generate a GS Coversheet

Run the ground stop program once the parameters have been set and the ground stop is ready to be implemented. Click the **Run** button on the *GDT Setup Panel* component. This will save the parameters to a specified FSM's configuration file and the GS Coversheet appears on the screen. Clicking **Run** will generate three reports, the FADT, the Analysis, and the Carrier Statistics report. All reports can be viewed by selecting **View** > *FADT, Analysis Report, or Carrier Statistics* from the Coversheet menu. The Carrier Statistics can also be viewed by selecting **Report** > *Carrier Statistics* from the main *Control Panel* component. See Reports in the following sections for more information.

GS Coversheet

The Ground Stop Coversheet contains all program parameter data to review before sending an TMI event.. You will send the Ground Stop out from the GS Coversheet (see Figure 18-18).

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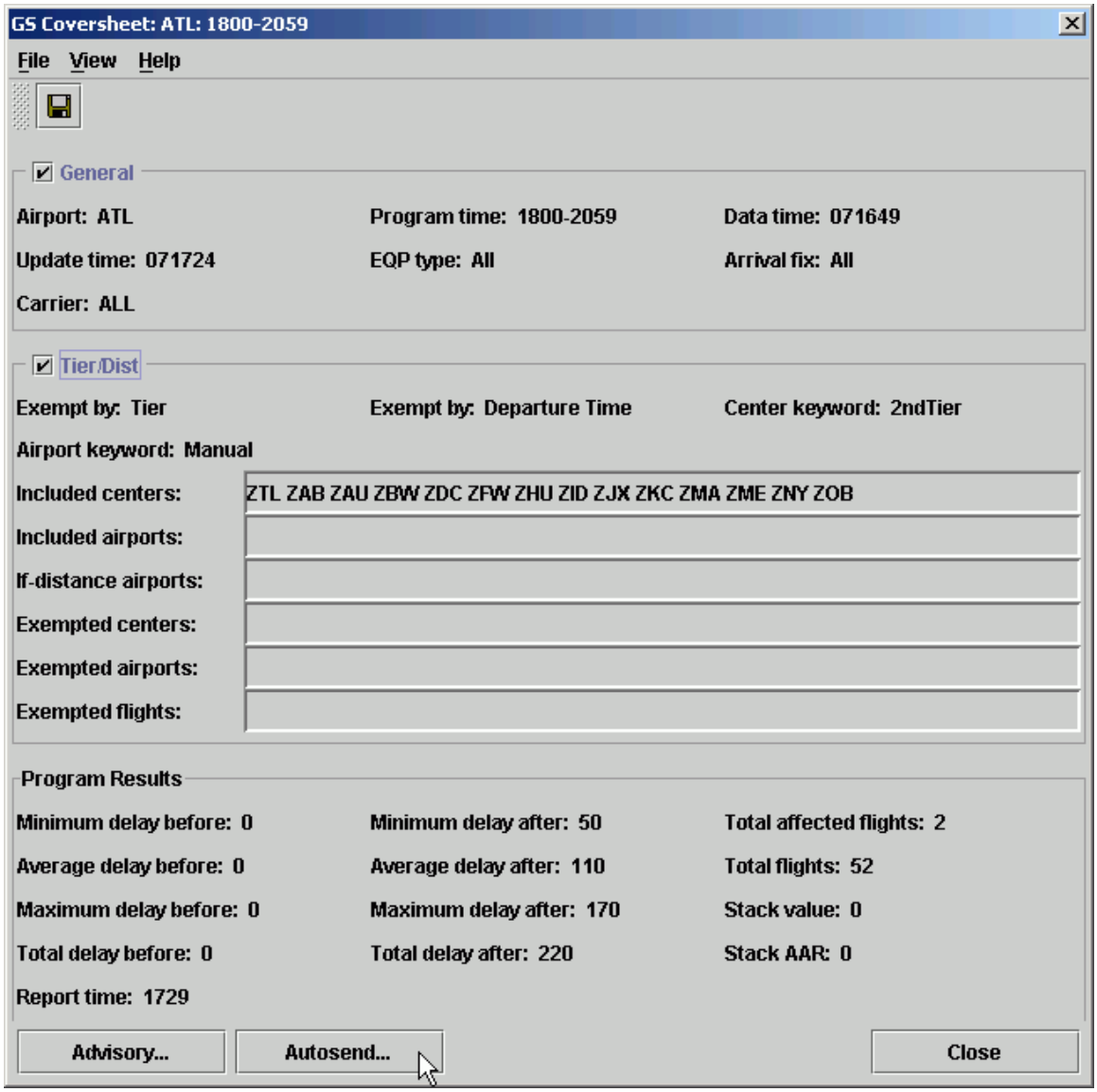

Figure 18-18: Ground Stop Coversheet

The following information is located on the GS Coversheet:

General Parameters:

- **Airport**: The affected airport where the GS is issued.
- **Program Time**: The GS time period (Start Time/End Time)
- **Data Time**: Current date and time (in Zulu time)
- **Update Time**: Last ADL time that passed before running the program.
- **EQP Type**: The Equipment Type selected to be included in the GS.
- **Arrival Fix:** The arrival fixes of the affected airport being included in the GS operation.
- **Carrier:** Carriers that operate at that airport are included in the GS. This can be "All" or a single major carrier and its sub-carriers. A three-letter airline code indicates that only

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one major carrier is included in GS. A single carrier included in the GS will always be a major carrier and its sub-carriers. It is never truly a "single" airline.

Tier/Distance

- **Exempt by Tier/Distance:** Displays if the Ground Stop is based on either Tier or Distance.
- **Exempt by Departure Time:** When Exempt By Departure Time is selected on the Tier/Distance Tab of the GDT Setup Panel, will display **Yes**.
- **Center Keyword:** Displays what, if any, center keyword (internal, 1st tier, 2nd tier, etc) was used during the Ground Stop setup.
- **Airport Keyword:** Manual is displayed when individual airports are selected.
- **Included Centers:** Centers included in the GS operation. If there are too many centers to fit in the space provided, you will see "..." and can click the arrow at the end of the field to pull down a menu with a complete listing of the facilities involved.
- **Included Airports:** Airports included in the GS operation. If there are too many airports to fit in the space provided, you will see "..." and can click the arrow at the end of the field to pull down a menu with a complete listing of the facilities involved.
- **Exempted Centers**: Centers that are within the scope of the GS but exempt from delay.
- **Exempted Airports:** Airports that are within the scope of the GS but exempt from delay.
- **Exempted Flights***:* List of flights exempted from the GS operation by call sign.

Program Results Summary

- **Minimum delay before:** The minimum delay given to any one flight included in the parameters before the program was run.
- **Minimum delay after:** The minimum delay given to any one flight included in the parameters after the program was run.
- **Total Affected Flights:** Total number of flights included in the GS operation (including cancelled flights) and the number of flights actually affected (non-exempt) by the GS (excluding cancelled flights). Note that any ATC Delay statistics are determined by (Max [0, CTA - BETA]).
- **Average delay before:** Total delay of flights in the GS operation divided by the Total Affected Flights in the operation before the program was run.
- **Average delay after:** Total delay of flights in the GS operation divided by the Total Affected Flights in the operation after the program was run.
- **Total Flights:** The total numbers of flights arriving at the monitored airport within the program start and end time.
- **Maximum delay before:** The longest delay assigned to any one flight in the GS before the program was run.
- **Maximum delay after:** The longest delay assigned to any one flight in the GS after the program was run.

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- **Stack Value:** Number of flights pushed out of the GS period as a result of running the GS.
- **Total delay before:** The sum of all delays resulting from this GS operation in minutes before the program was run. Determined by CTA - OETA
- **Total delay after:** The sum of all delays resulting from this GS operation in minutes after the program was run. Determined by CTA - OETA
- **Stack AAR:** The AARs that occur in the hours after the end time of the GS, but that still have CTA flights in them because of GS delay.
- **Report Time**: The current date and time in [ddhhmm] format. Note that the time is according to the 24-hour clock in Zulu time.

Re-Open the Coversheet

If you want to review previous Coversheets for the airport or if you accidentally closed the Coversheet before sending out the advisory, you can re-open it for review or to continue sending out the program. Select **File** > *Open* from the FSM *Control Panel*. This opens a file selection window for the Reports directory. You should see all Coversheets generated for that airport. Note that the Coversheet files are kept in the reports directory until you choose to delete them.

Coversheet files are generated when you run a new or revised GDP, Ground Stop, Compression, or Substitution. Coversheets are also generated when you purge (cancel) a program. You can differentiate between the different Coversheet files by looking at the last few letters in the file name. `GDP' indicates a GDP Coversheet. `GS' indicates a Ground Stop Coversheet. `COMP' indicates a Compression Coversheet. `SUBS' indicates a Substitution Coversheet.

A typical Coversheet file is named by: Type of file (for Coversheets, it is always covr), airport, 2-character date (just the day), time generated (HHMMSS), rate used, type of Coversheet (gdp, gs, comp, subs), and the center group included. For example, a file named "covr.SFO.28150808.3030.GDPNew.ALL" indicates a New GDP (first GDP of the day) Coversheet generated for SFO airport on the 28th at 1508Z with a 30 rate that includes all centers in the program.

Once you find the appropriate Coversheet file, click on the file name to select it and click **Open**. The Coversheet will open in FSM exactly as it appeared the first time it was generated. If the Coversheet is still valid to send out a program, the buttons at the bottom of the Coversheet will be enabled. If the Coversheet is no longer valid, the buttons are grayed out.

> **Note:** Even if the Coversheet is still valid, enough time may have passed that it would be better to generate a new program and Coversheet.

GS Coversheet Menu Options

There are three file menu options available on the GDP Coversheet: **File, View** and **Help**.

1. **File Menu**

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File > *Save As…*Opens a previously created coversheet in FSM. The default format is fsmc.<airport> followed by the date, time, and GDP information.

File > *Save Web coversheet As…*Saves the Coversheet information to a file for later use. Note that the Coversheet will save itself in a pre-defined file format that may not exactly match the software display on your computer monitor. The default format is covr.<airport> followed by the date, time, and GDP information.

File > *Close* - Closes the GS Coversheet window

2. **View Menu**

View > *FADT* **–** Displays the FADT Report.

View > *Analysis* **–** Displays the Analysis Report (See Analysis Report.)

View > *Carrier Statistics* **-** Displays a report with various carrier delay statistics.

3. **Help Menu**

Help > *Coversheet* **–** Accesses the web-based on-line help for GS Coversheet information.

Once the GS Coversheet had been completed and all checkboxes are marked, you can either send out an **Advisory** or **Autosend** the GS to Volpe.

When you click **Advisory**, the Advisory Window is displayed, which allows you to send either a Proposed or an Actual Advisory to all FSM users. See the next section, Sending an Advisory for more information.

Press **AutoSend** from the GS Coversheet to send the FADT List to both the Hub and Airlines. See Sending an Actual GS (Autosend) on page 317 for more information.

When you click **Close**, no action will be taken from the GS Coversheet window.

Sending an Advisory

To compose either an Actual or Proposed GS Advisory, click the **Advisory** button from the GS Coversheet. The GS Advisory window appears (see Figure 18-19). This window contains all the GS parameters to be sent to all participants and a separate *Remarks* section that must be filled out before sending an Advisory.

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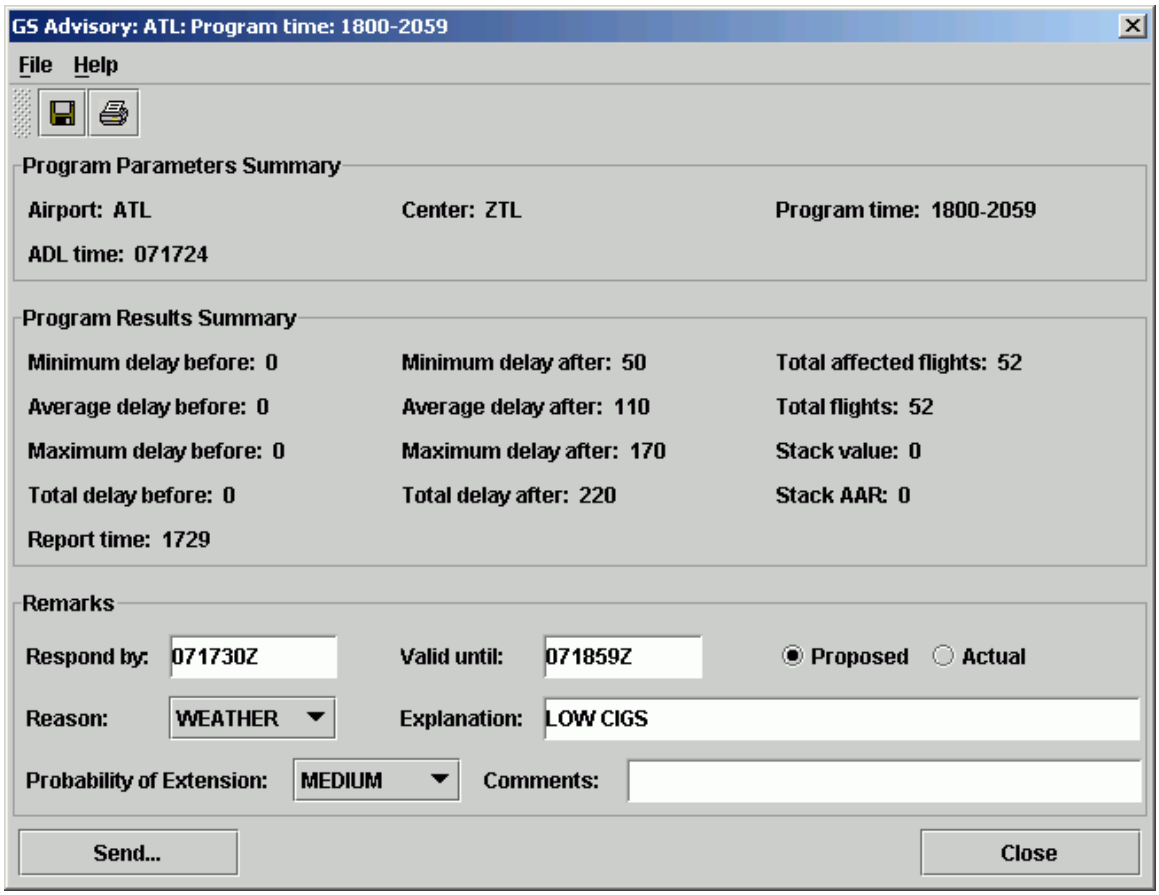

Figure 18-19: Send a GS Advisory

The following information is found in the GS Advisory:

Program Parameters Summary

- **Airport**: The airport for which a ground stop is being enacted.
- **Center**: The center that includes the affected airport.
- **Program Time**: The times at which the GS will start and end.
- **Data Time**: The time of the last ADL used before the program was run.

Program Results Summary

The Program Results summary on the Advisory window contains the exact same information at the GS Coversheet Results Summary excluding the scroll window information (see Program Results Summary on page 312).

Remarks

The remarks section must be filled out before sending an Advisory.

- **Respond By (Proposed Advisory only):** The time by which users must respond to a Proposed GS. It is normally defined as the current time plus 30 minutes. That time is then rounded up to the next 15-minute time increment. For example, if the current time is

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1812, the Respond By time is 1845 (1812 + 30 = 1842. Round up to the nearest 15-minute increment is 1845).

- **Valid Until**: The time at which the Advisory message will expire. Normally defined as the Respond By time plus 20 minutes and rounded up to the end of the hour. For example, if the Respond By time is 1845, the message is valid until 1959. The message could also expire at the same time the program ends.
- **Proposed/Actual**: The two types of advisories available to send. A Proposed Advisory lets users know about a potential GS and allows users to send comments about the parameters before the program is enacted. An Actual Advisory lets users know that a program is definitely going to be enacted and does not allow users to comment on the parameters.
- **Reason**: Select a reason for running the GS from the available pull down menu. Click to pull the menu down and then click to select one of the available reasons: Weather, Volume, Runway, Equipment, and Other.
- **Explanation**: If you select "Other" in the Reason field, you must type a reason or other commentary in the Explain field before an Advisory can be sent.
- **Probability of Extension**: Select the level (low, medium, or high) of probability that the Ground Stop will be extended beyond one hour. The default value is Medium.
- **Comments**: This field is available for any additional comments about the program you feel are necessary.

You must either select the **Proposed** or **Actual** radio button to send the appropriate Advisory. By default the Proposed radio button is selected.

- When a **Proposed Advisory** is sent, FSM will copy the Advisory file to an HP machine at the FAA's ATCSCC. It will also send the GS parameters to the Hub site for inclusion in the next ADL. A Proposed GS is a program being recommended by the FAA, but not immediately implemented. A Proposed GS allows NAS users time to comment on the proposed parameters and may change before an actual program is implemented.
- When an **Actual Advisory** is sent, FSM will copy the Advisory file to an HP machine at the FAA's ATCSCC and send the parameters to the Hub site. However, the Hub site will not send the program parameters in an ADL until it receives the matching FADT list with flight control times for the program. The FADT list is sent through the **Autosend** function on the GS Coversheet.

Once you have completed the GS Advisory, press **Send** to email the program parameters to all parties involved in the program, including the Hub site. A checkmark will appear next to the **Send** button on the Advisory window and next to the **Advisory** button on the GS Coversheet to indicate that the advisory has already been sent.

If the parameters are for a Proposed Advisory, Volpe will send out the parameters immediately in the next ADL. When parameters for an Actual Advisory are sent, Volpe

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will ensure that it has received the associated FADT file with flight control times for the program before sending any parameters through the ADL.

When you click **Close**, no action will be taken from the GS Advisory window.

Sending an Actual GS (Autosend)

An Actual GS is a program that is going to be implemented by the FAA; user comments have already been gathered and the program is ready to be enacted. If you are preparing an *Actual GS*, you need to send a FADT file through the **Autosend** function.

There are two steps to enact the GS program and send the parameters out through the ADL. Program parameters for an Actual program are not sent through the ADL until Volpe receives both the program parameters (through an Advisory) and a matching FADT list with flight control times. Once these are both received, the program parameters and control times are sent through the ADL to all FSM users and the program is implemented.

1. **Advisory** - From the GS Coversheet, click **Advisory** to complete the advisory for the actual program. The GS Advisory window will appear (See Sending an Advisory on page 314). Complete the fields required in the GS Advisory window, insure that the "Actual" radio button is selected on the GS Advisory. The advisory will contain the program parameters for Volpe to send through the ADL.
2. **Autosend** - From the GS Coversheet, click **Autosend (see** Figure 18-20**)**. The FADT File is sent automatically to the Hub and Airlines. The FADT file is still forwarded to Autosend at the ETMS terminal so that you can re-send the file if there is a problem with the initial transmission. The Hub site will not send out any actual program information through the ADL unless there is an Actual Advisory with parameters matching the FADT.

Note: If you choose Compose **Advisory** or **Autosend** more than 15 minutes after switching to GDT Setup, FSM will warn you to return to Monitor Mode (Live) and get the most recent data from an updated ADL before continuing with the Ground Delay Operation.

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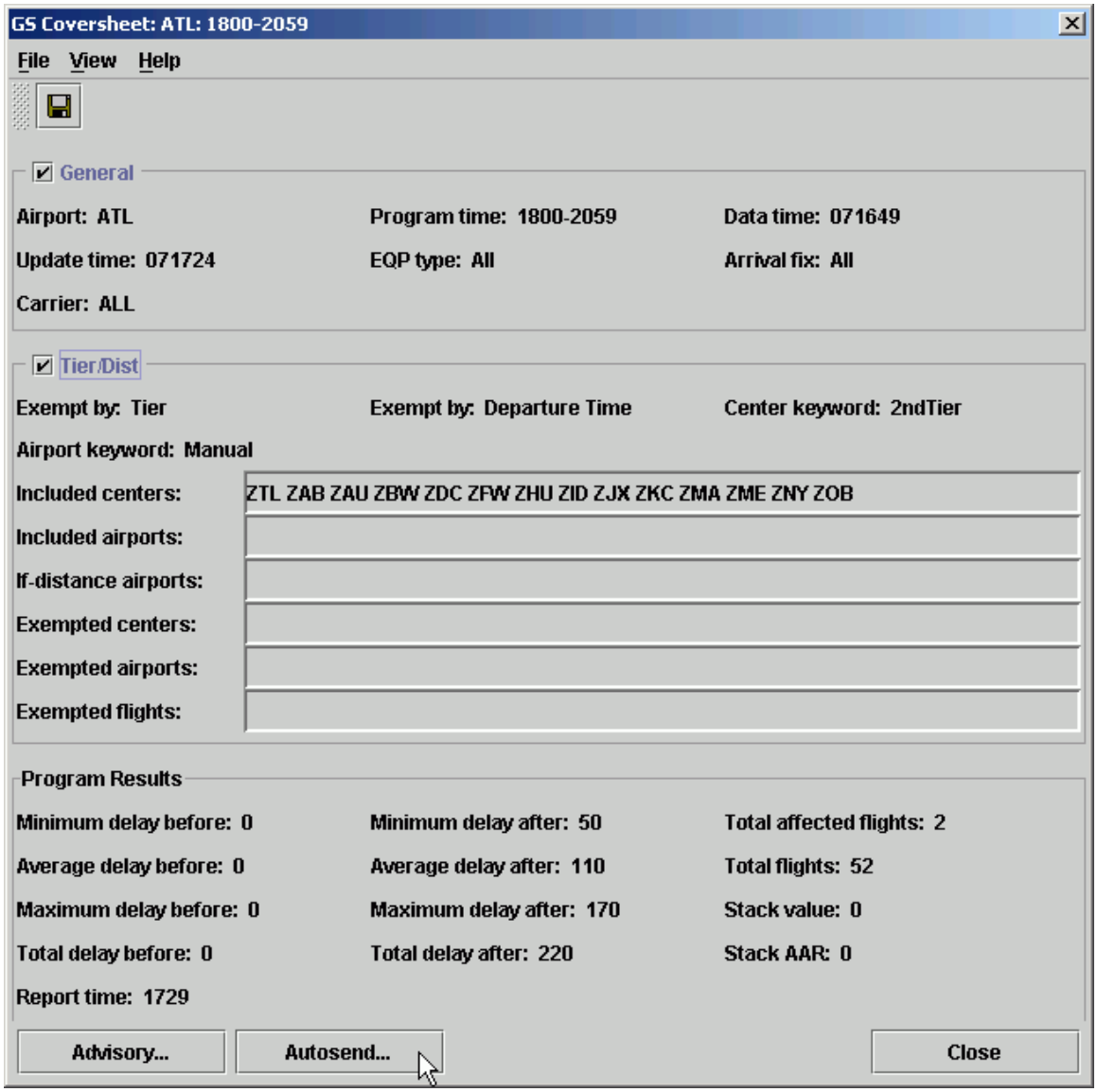

Figure 18-20: Autosend

Reports

FADT Report

FADT reports are generated when the GS operation is **Run**. A FADT reports contains program parameters and delay statistics for the Ground Stop. To review the FADT file, select **View** > *FADT Report* from the GS Coversheet and the FADT Report window will appear displaying the program information (see Figure 18-21).

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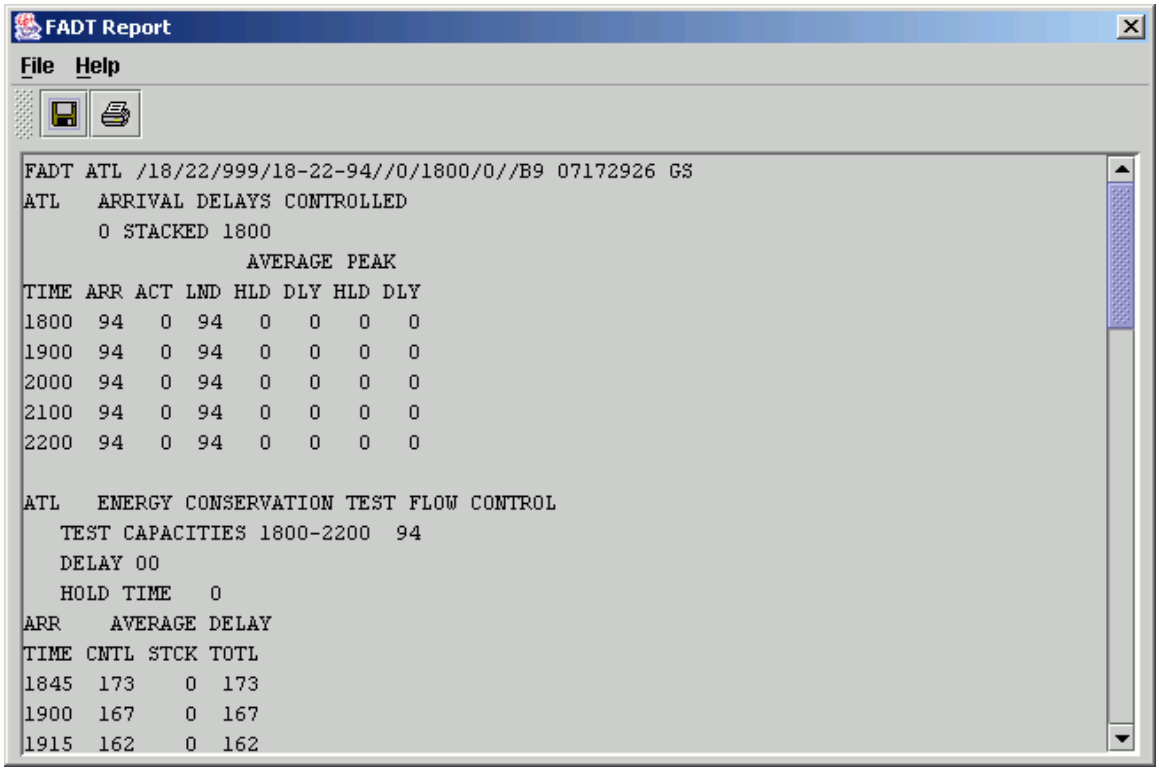

Figure 18-21: FADT Report

Analysis Report

FSM also allows you to analyze programs after selecting **Run** from the GDT Setup component. To evaluate the effects of a ground delay operation after the operation is run, select **View** > *Analysis Report* from the GS Coversheet. FSM automatically opens the spreadsheet application you have indicated in your configuration files to display the Analysis Report.

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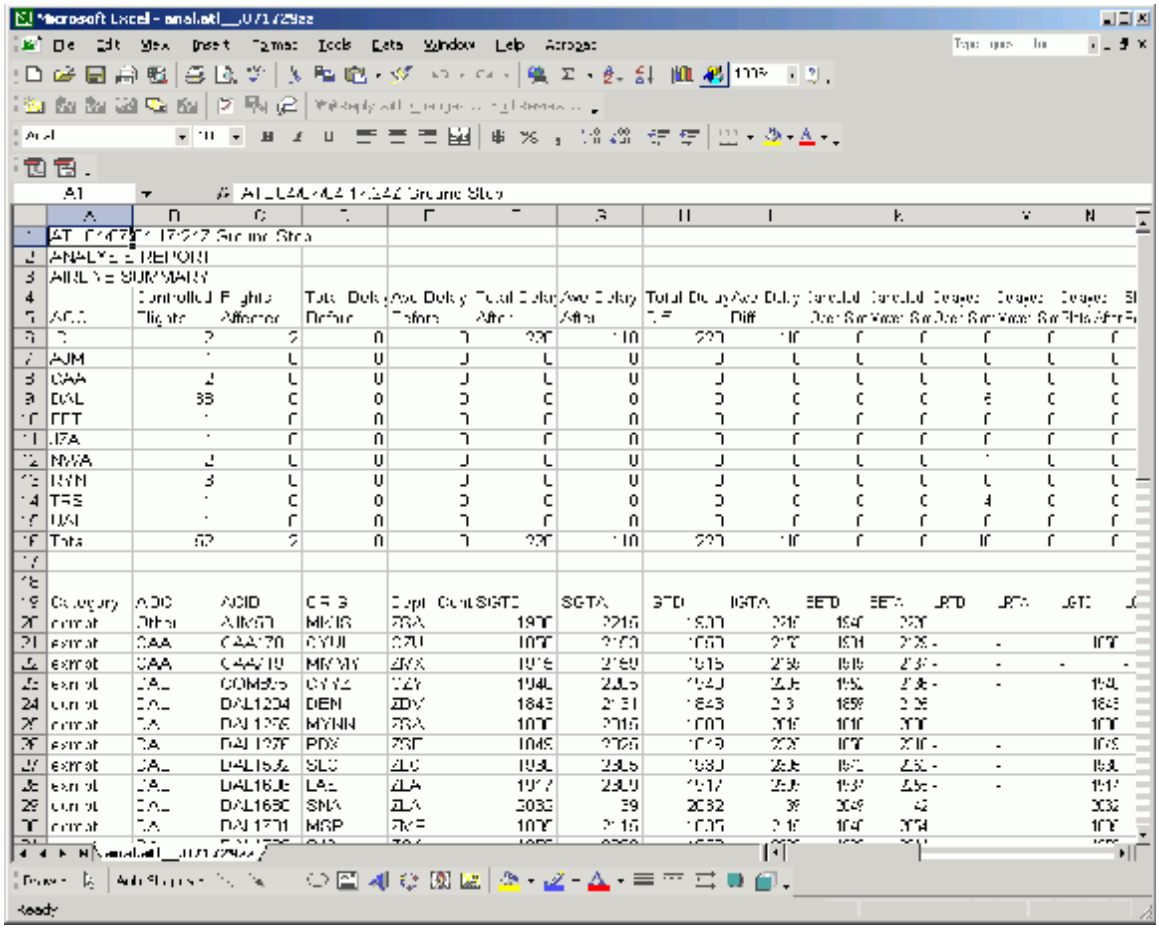

Figure 18-22: Analysis Report

The Analysis Report contains information pertinent to the Ground Stop Operation that has just been run, including detailed slot information for individual airlines, delay statistics for before and after the operation and arrival and departure information for carriers and each individual flight.

Carrier Statistics

To view the Carrier Statistics select **View** > *Carrier Statistics* from the GS Coversheet or it can be viewed from the *Control Panel* by selecting **Reports** > *Carrier Statistics.* Make sure the desired airport is in focus to review the correct airport's carrier statistics when selecting Carrier Statistics from the *Control Panel*. From the Carrier Statistics report you have the option to view ATC delay or ABS. ABS Delay is the *absolute delay* on a flight, including FAA and airline delay imposed on the flights. Absolute delay is calculated using Max (0, ETA - [IGTA - Taxi]). ATC Delay is the *delay imposed only by the FAA* on flights and is calculated using Max (0, CTA - BETA). The Carrier Statistics report is based on flight's ETA and displays specific delay information for each carrier's flights. The Carrier Statistics report is particularly helpful to airlines. Airlines can view how the GS is affecting them. Figure 18-23 is an example of the carrier statistic report being viewed by ATCSCC personnel. Airlines would only see their call sign and any sub-carriers. All other airlines would be considered "Other". For more information on the Carrier Statistics report, please see Chapter 8.

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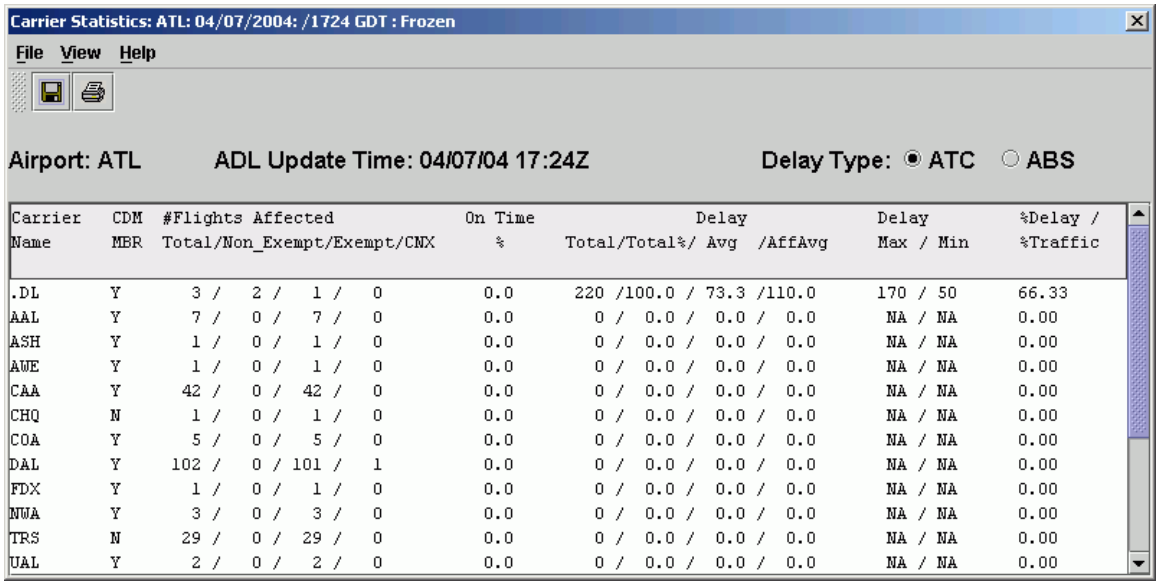

Carrier Name	CDM MBR	#Flights Affected Total/Non_Exempt/Exempt/CNX	On Time %	Delay Total/Total%/ Avg /AffAvg	Delay Max / Min	%Delay / %Traffic
.DL	Y	3 / 2 / 1 / 0	0.0	220 /100.0 / 73.3 /110.0	170 / 50	66.33
AAL	Y	7 / 0 / 7 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
ASH	Y	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
AWE	Y	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
CAA	Y	42 / 0 / 42 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
CHQ	N	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
COA	Y	5 / 0 / 5 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
DAL	Y	102 / 0 / 101 / 1	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
FDX	Y	1 / 0 / 1 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
NWA	Y	3 / 0 / 3 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
TRS	N	29 / 0 / 29 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00
UAL	Y	2 / 0 / 2 / 0	0.0	0 / 0.0 / 0.0 / 0.0	NA / NA	0.00

Figure 18-23: Carrier Statistics Report

Purge a GS

To purge (cancel) and release flights from the Ground Stop, use the Purge function from the GDT *Setup* Component. The Purge option requires no user input. Once the Purge option is selected, all the TABs in the setup panel are grayed out. Click **Run** to generate the GS Purge Coversheet.

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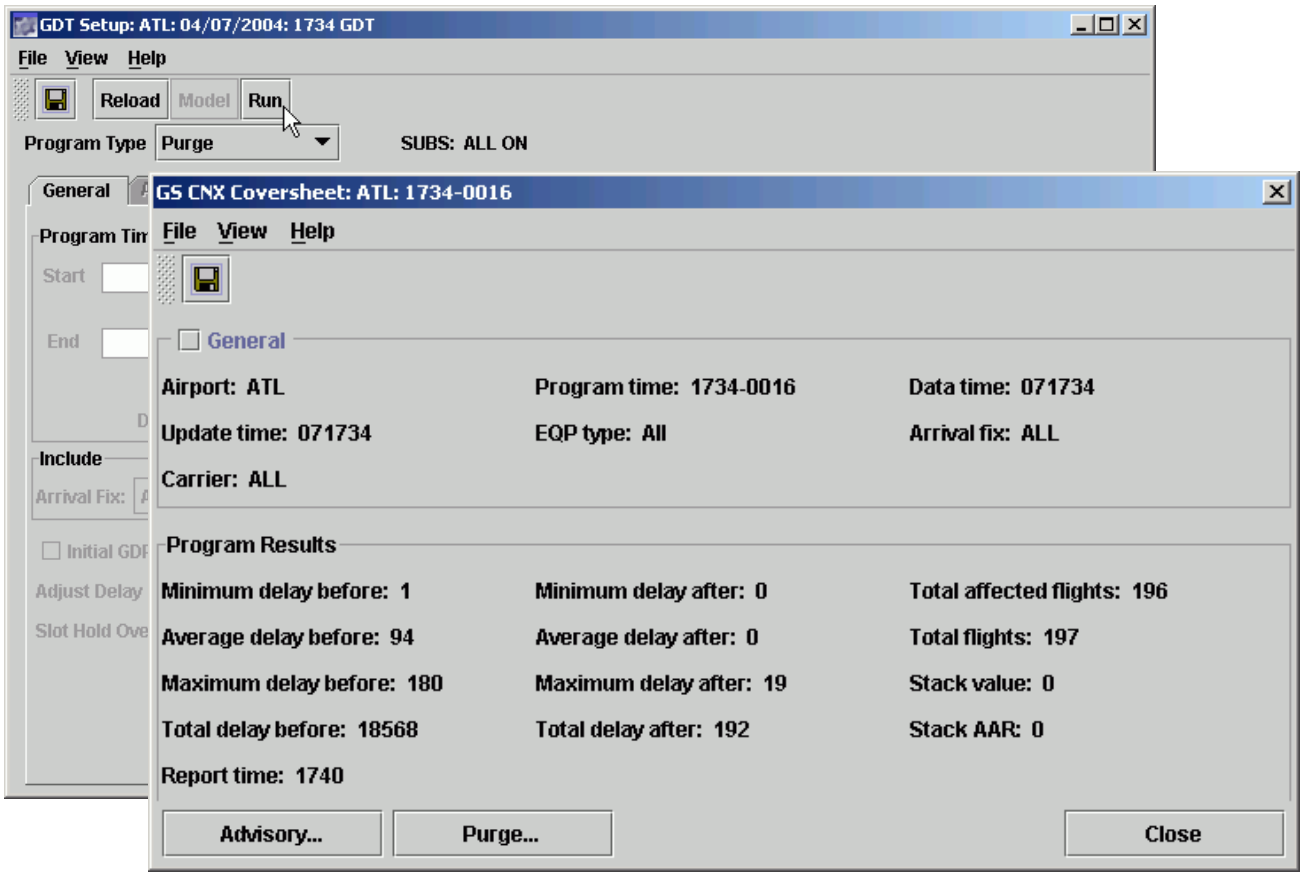

Figure 18-24: GS CNX Coversheet

The information included in the Purge Coversheet is pre-defined and cannot be changed. Information on the Purge Coversheet includes:

General Parameters

- **Airport** - The airport for which the program is being implemented.
- **Program time** - The time period covered by the program. Default time period lasts until the latest ETA of the last CTA flight.
- **Data time** - The current date and time in Zulu [ddhhmm].
- **Update time**: The date and time that the Purge was modeled [ddhhmm].
- **EQP type**: The equipment type that is included in the program. All is selected by default.
- **Arrival Fix** - Arrival fixes included in the program.
- **Carrier**: All carriers included in the GDP cancellation.

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Program Results

The Program Results summary on the Purge coversheet contains the exact same information asthe GS Coversheet Results Summary excluding the scroll window information (see Program Results Summary on page 312).

From the **CNX Coversheet**, click **Purge** to purge any control times from the ETMS system. Purge works the same as the **Autosend** function to send new operation parameters and cancellation messages to the Hub site for inclusion in the ADLs. Finish the GS cancellation by clicking **Advisory** to send a Purge advisory to all users.

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19 Other Ground Stop Functions

Once a Ground Stop (GS) is already in place, the conditions that originally necessitated the Ground Delay Program (GDP) may change. This chapter will cover additional GS features that are used when conditions demand modifications to an already existing GS:

- Reducing the Scope of a GS
- Extending a GS
- Moving from a GS to a GDP

Reducing the Scope of a Ground Stop

To reduce the scope of an existing Ground Stop you must open GDT mode and purge the current GS for all flights and then issue another Immediate GS with the reduced scope.

> **Note:** Before Purging a Ground Stop, communication with all operators is encouraged to notify them that another Immediate GS program will be implemented shortly after the Purge.

Make sure the Ground Stopped airport that you wish to modify is active before pressing the **GDT Setup** button on the main *Control Panel* component. This will open the four default GDT components for the selected airport. Select **Program Type** *Purge* from the *GDT Setup* component and press **Run** to purge the existing GS (see Figure 19-1). The Purge Program type requires no parameter modifications; therefore all Tabs are grayed out.

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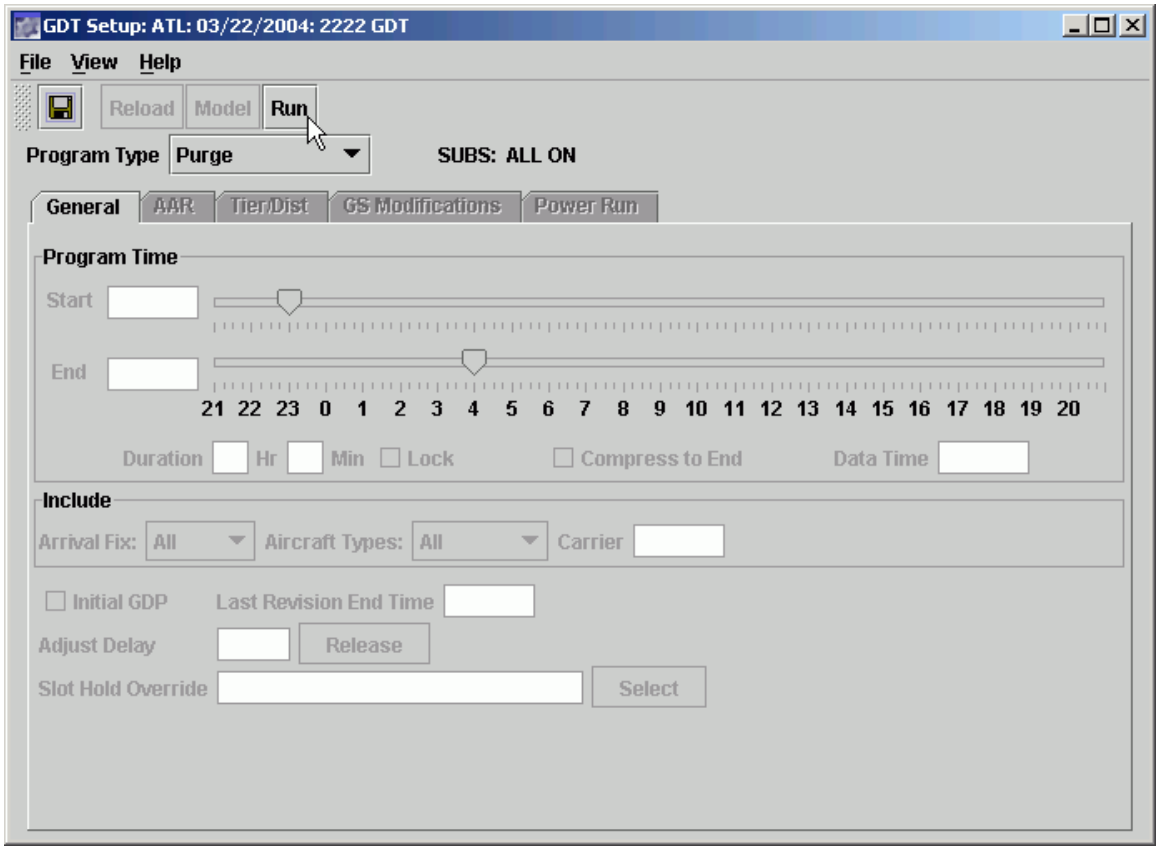

Figure 19-1: GS Purge

Pressing **Run** to Purge/CNX the current Ground Stop program will open the GS CNX Coversheet (see Figure 19-2). The information included in the Purge Coversheet is pre-defined and cannot be changed. See chapter 17 for more information on GS Purge Coversheet information.

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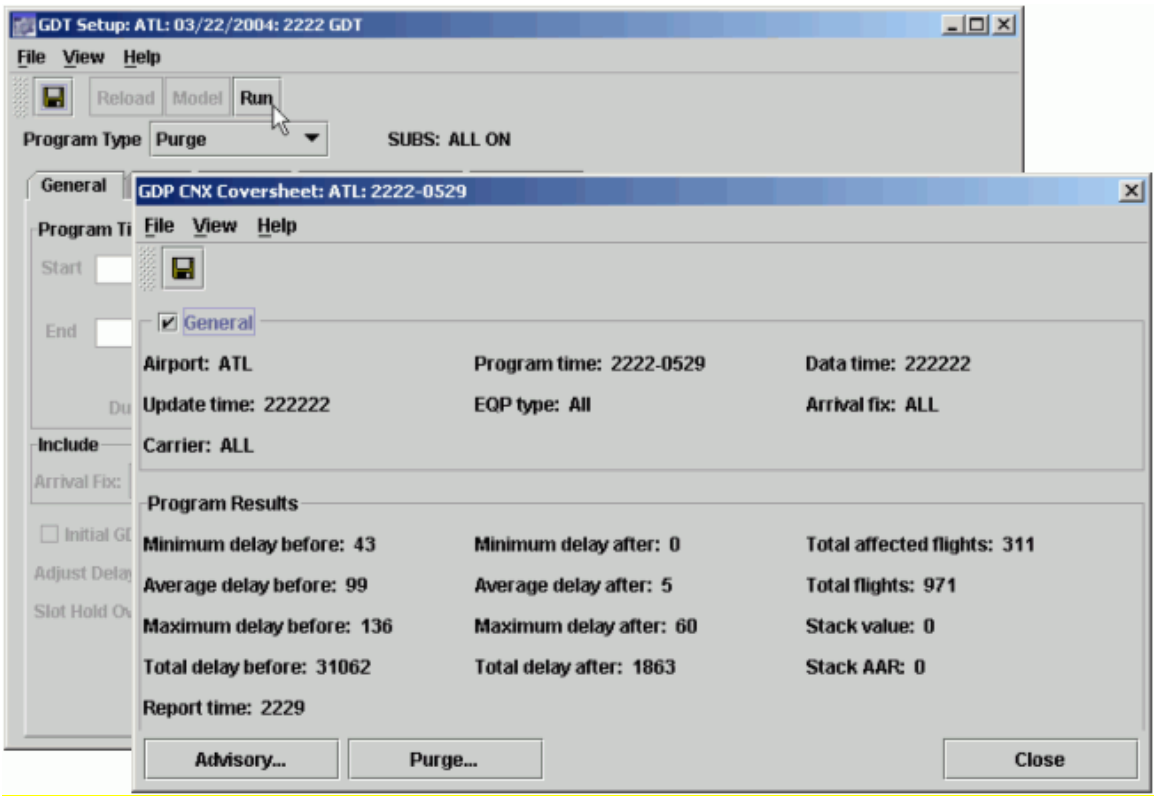

Figure 19-2: GS CNX Coversheet

From the *Purge Coversheet,* press **Purge** to purge any control times from the ETMS system. Purge works the same as the **Autosend** function to send new operation parameters and cancellation messages to the Hub site for inclusion in the ADLs. Note that the Hub site will wait for an cancelled GS Advisory before sending the new parameters. Finish the GS purge/cancellation by clicking **Advisory** and send a GS CNX Advisory.

Once both the Purge command and the GS Purge Advisory has been sent from the GS Purge Coversheet, it is important to wait for the Purge to be reflected in the next ADL before issuing the revised GS. View the airport in live mode to ensure that the GS has been purged.

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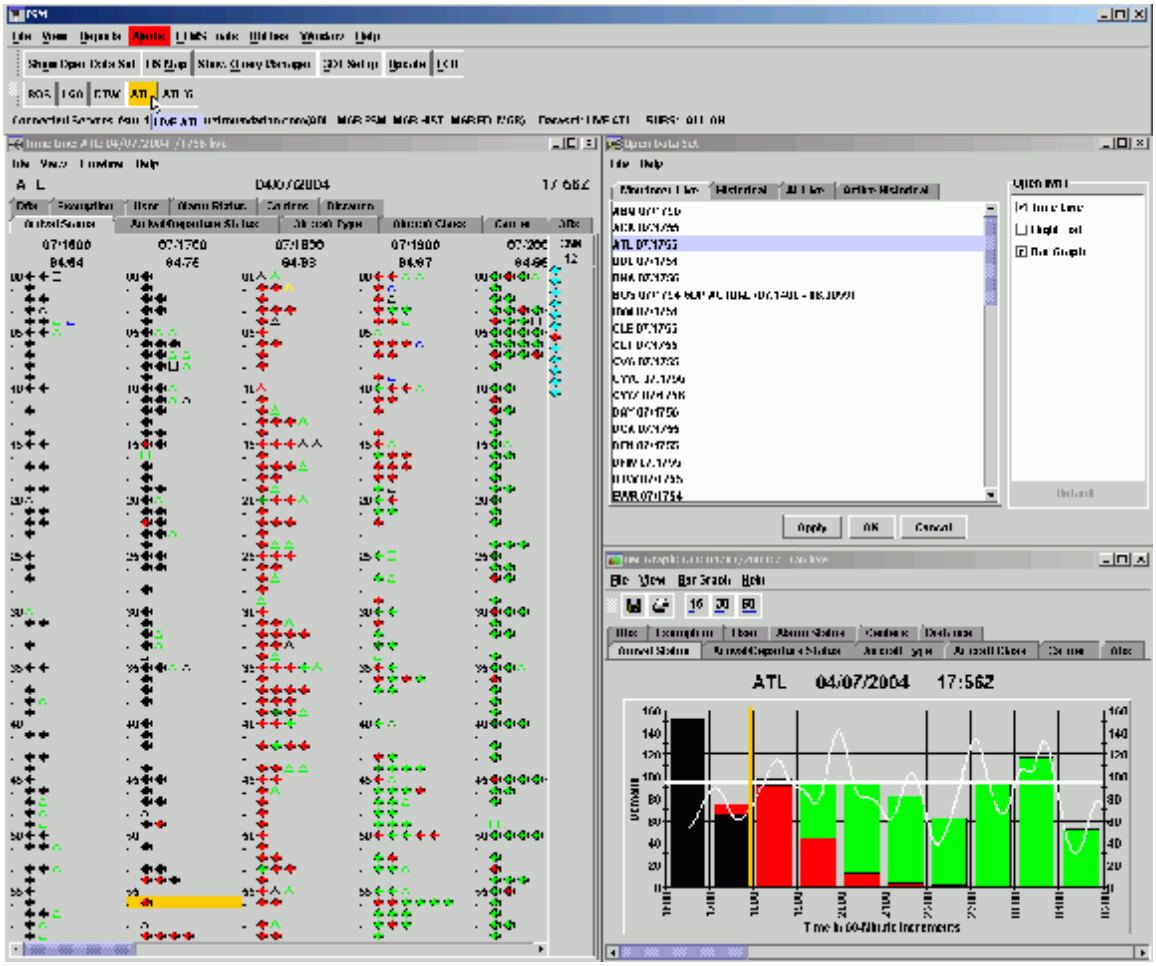

Figure 19-3: GDP Purged

Once the Purge has been reflected, it is now safe to issue a GS Immediate with the reduced scope parameters in GDT Mode. Fill in the GS parameters as needed. Once the GS parameter inputs have been made, press **Reload** or **Model** on the *GDT Setup* component to view the delay statistics for the new scenario and make adjustments if necessary. Once the GS Immediate is ready to be issued, press **Run** from the *Setup* component to open the GS Immediate Coversheet. From the GS Immediate Coversheet, send both the **Autosend** and **Advisory** to implement the new GS. See Chapter 17 for more detail on how to issue a GS.

Extending a Ground Stop

To extend an existing Ground Stop, Make sure the Ground Stopped airport you wish to modify is active before pressing the **GDT Setup** button on the main *Control Panel* component. This will open the four default GDT components for the selected airport. Select GS Immediate from the Program Type drop-down menu and then select **File** > *Load Actual Parameters* > *Ground Stop*, as shown in Figure 19-4. After the actual parameters have been loaded, adjust the parameters and extend the Ground Stop Time as

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necessary. Click **Model** to view the Delay Statistics in the Data Graph and make any adjustments as needed.

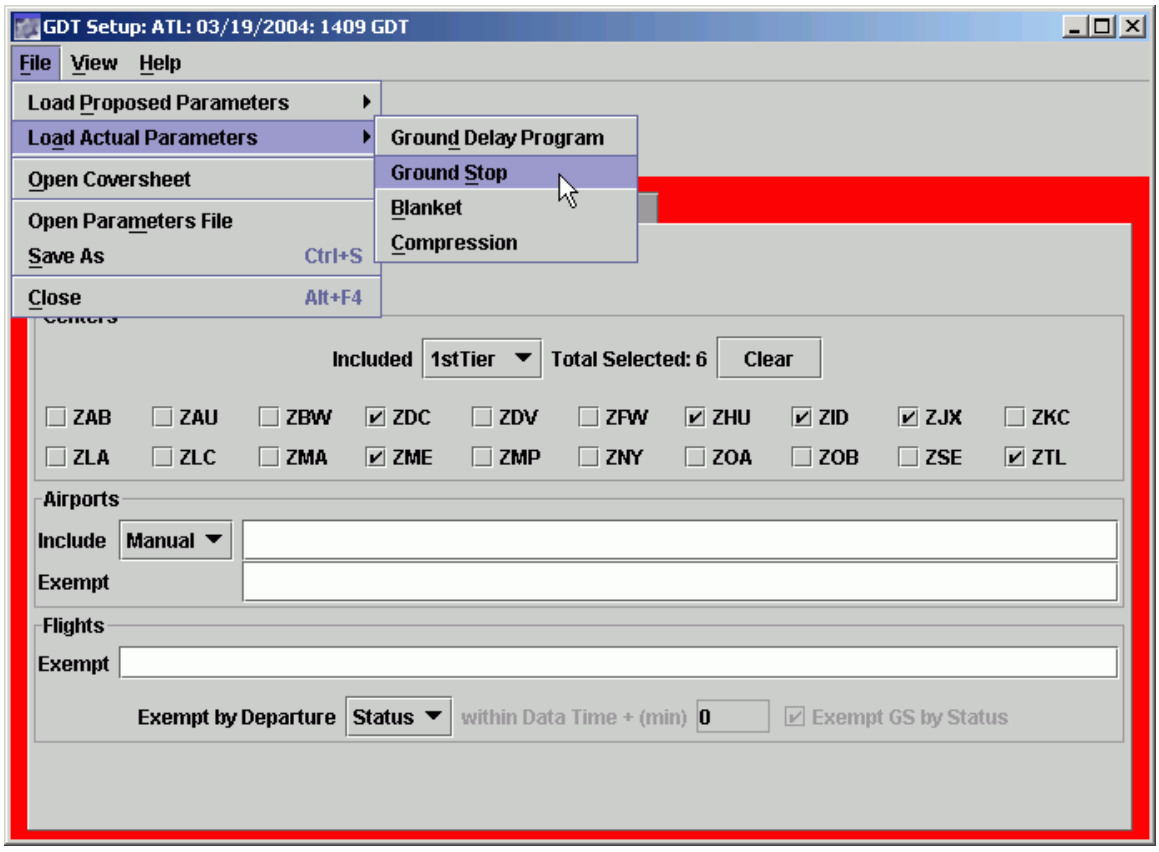

Figure 19-4: Load Actual Parameters > Ground Stop

Run the Ground Stop program once the parameters have been modified and the Ground Stop is ready to be implemented. Click the **Run** button on the GDT *Setup* component. This will save the parameters to a file specified in FSM's configuration file and open a GS Coversheet. Clicking **Run** will generate three reports, a FADT, Analysis, and Carrier Statistics report, which can be viewed by selecting **View** > *FADT, Analysis Report, or Carrier Statistics* from the Coversheet menu. The Carrier Statistics can also be viewed by selecting **Report** > *Carrier Statistics* from the main *Control Panel* component

GS Coversheet

The Ground Stop Coversheet contains all the operation's parameter data as well as space for you to type in additional information. You will send the Ground Stop out from the Ground Stop Coversheet.

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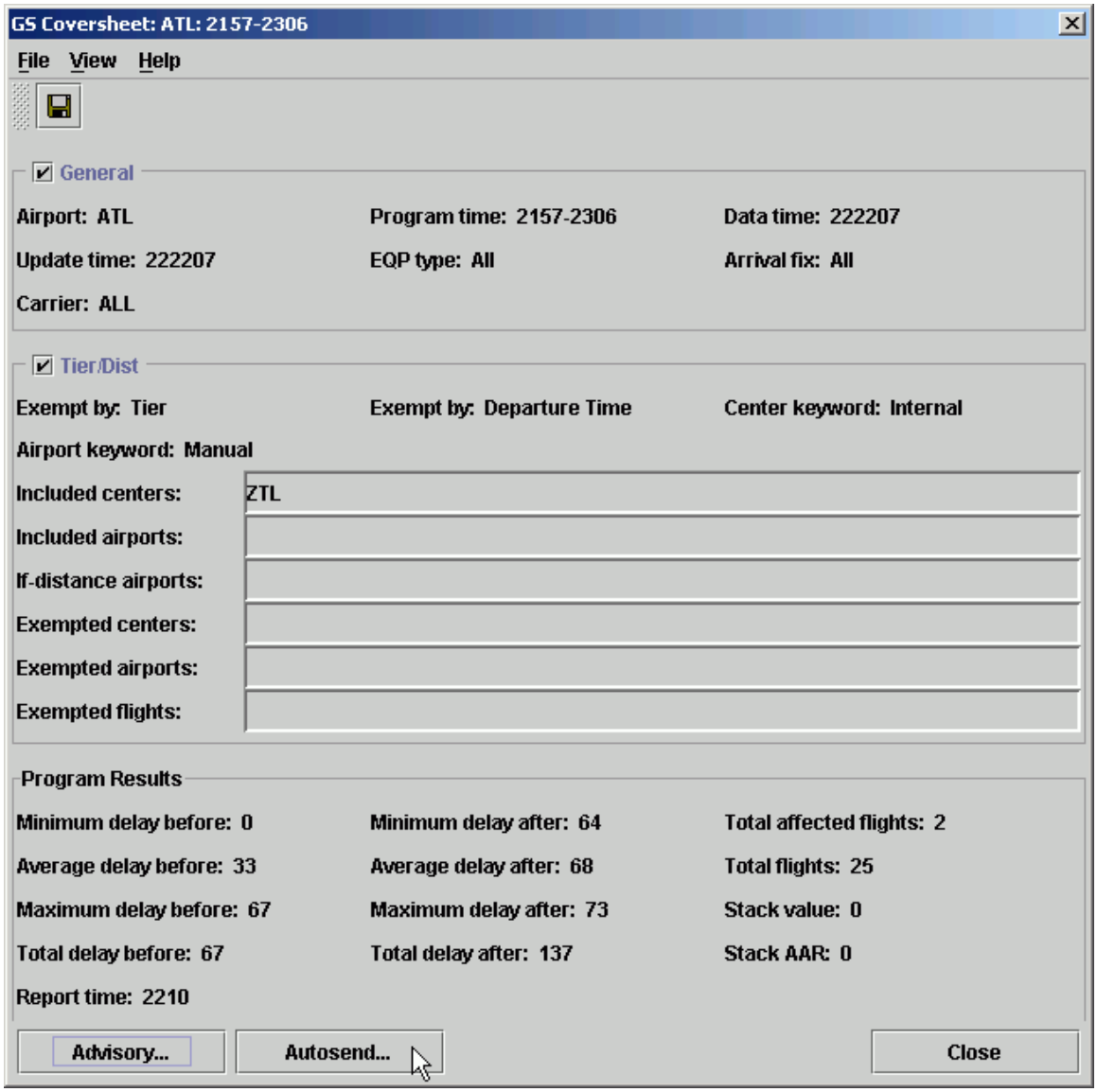

Figure 19-5: GS Immediate Coversheet

Once the GS Coversheet had been completed and all checkboxes are marked, you can either send out an **Advisory** or **Autosend** the GS to Volpe (see Figure 19-5)

When you click **Advisory**, the Advisory Window is displayed, which allows you to send either a Proposed or an Actual Advisory to all FSM users. When you click **Autosend** from the GS Coversheet, a pop-up menu will appear that allows you to specify what information from the FADT file you wish to send to those involved in the GDP (ALL, FA only, EDCTs only, or Cancel).

Send a Proposed Advisory

Click Advisory from the GS Coversheet to open the Advisory window (see Figure 19-6). Enter the reason for the GS revision, the time when subs will be turned off, and select the Proposed radio button on the Advisory window. Sending a proposed advisory allows users to react to the proposal before the actual Ground Stop revision is implemented.

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Click **Send** from the Advisory window and the program parameters will be emailed to all parties involved in the program, including the Volpe Hub. A checkmark will appear next to the **Send** button on the Advisory window and next to the **Advisory** button on the GS Coversheet to indicate that the advisory has already been sent. If the parameters are for a Proposed Advisory, the ETMS Hub site will send out the parameters immediately in the next ADL. When parameters for an Actual Advisory are sent, you must also **Autosend** the programs associated FADT file with flight control times before Volpe will send the parameters through an ADL.

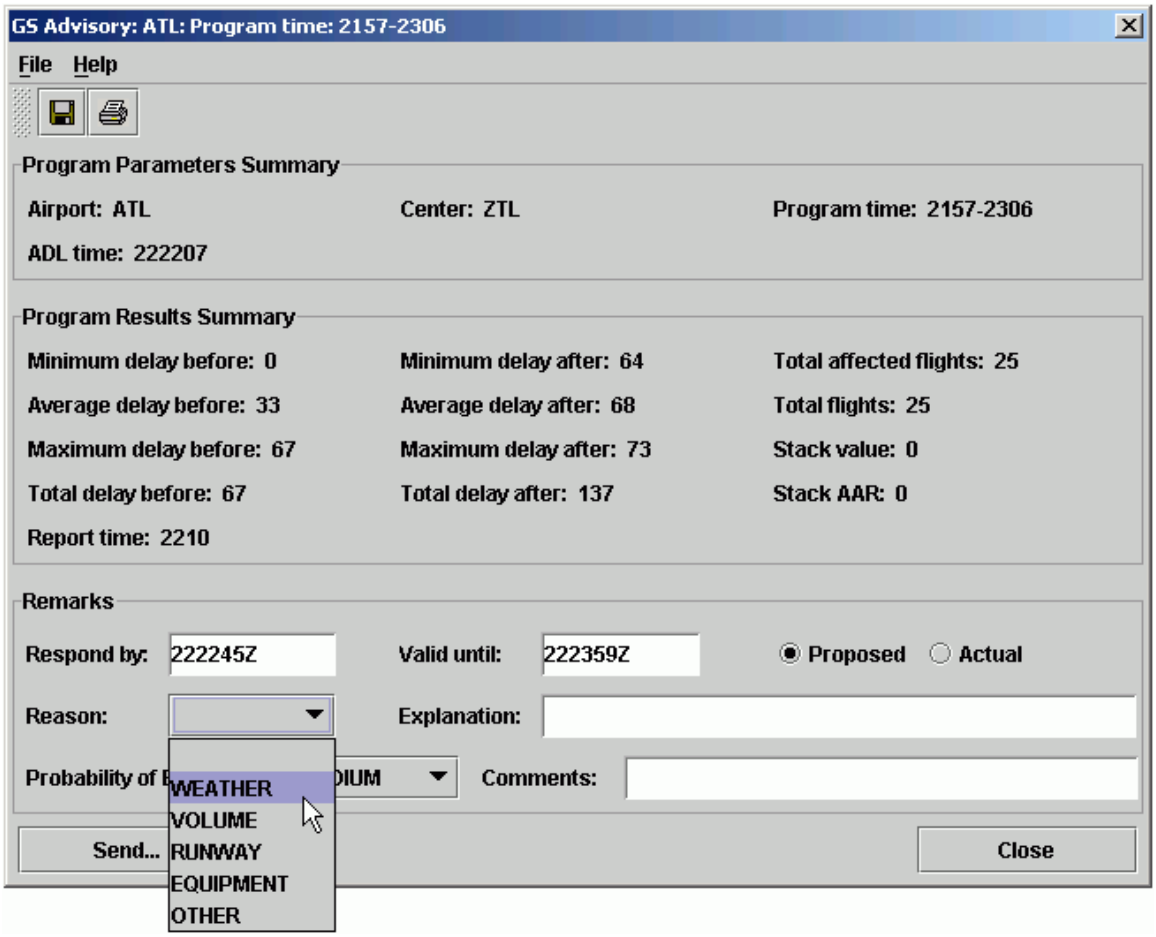

Figure 19-6: GS Advisory - Proposed

After response time has expired from the proposed advisory, select **ETMS Tools** > *EDCT Commands* > *EDCT Sub OFF* from the *Control Panel* component to turn substitutions off. On the GDT *Setup* component, select Program Type GS Immediate and select **File** > *Load Proposed Parameters* > *Ground Stop*. Click **Run** from the *Setup* component to open the GS Immediate Coversheet. From the GS Immediate Coversheet, click **Autosend** to send the FADT, send the GS EDCTs to the hub and airlines only and **Advisory** to implement the new GS. Click Advisory on the GS Immediate Coversheet to open the Advisory window. Enter the reason for the GS revision and ensure that the Actual radio button is selected before pressing **Send**. After both Autosend and an actual Advisory are sent, close the Coversheet and return to view the airport in Monitored Live mode. See Chapter 17 for more detail on how to issue a GS.

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Moving from a GS to a GDP

When issuing a GDP at an airport that already has a Ground Stop in place, make sure the Exempt Flights by departure Status (rather than by Time) on the *GDT Setup* component's Tier/Dist Tab is selected. Exempting flights by departure status is necessary to capture flights affected by the Ground Stop.

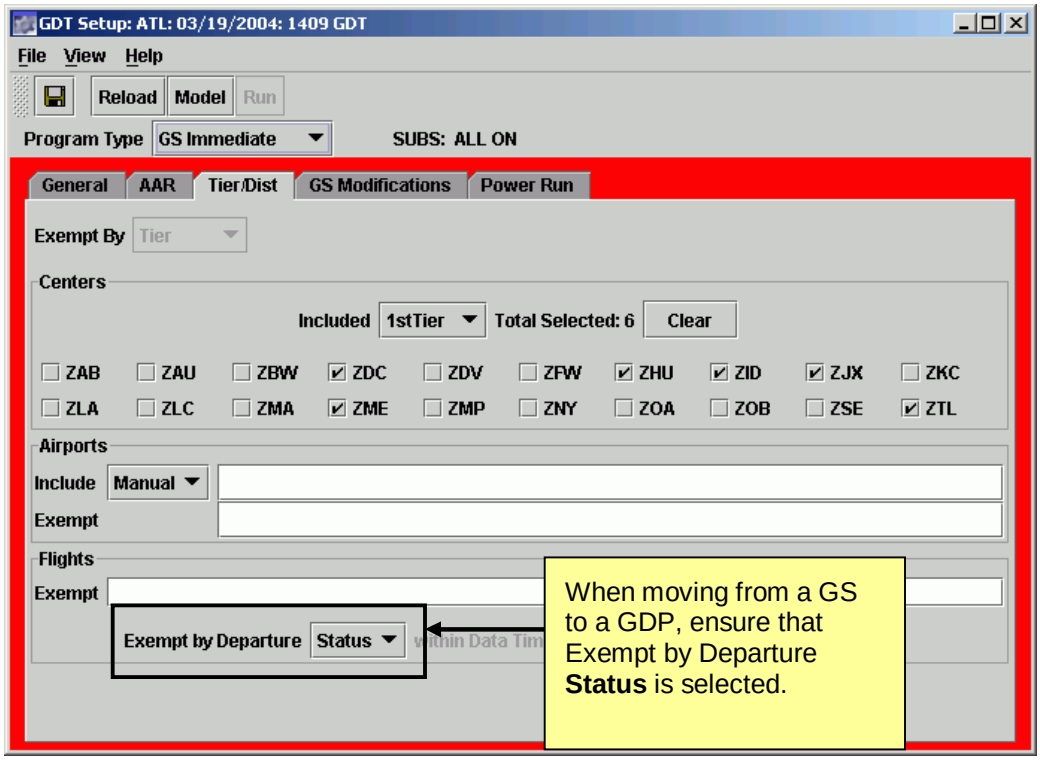

Figure 19-7: Tier/Dist Tab set up for moving from at GS to a GDP

See Chapter 10 for more information on sending a GDP.

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Appendix A: Flight Status

In the Flight Information Window, the flight Status is displayed. Flight Status may be one of the following:

- **Normal** - This flight is flying as expected
- **FX Canceled** - Generated when and airline sends an FX cancellation message.
- **NAS Canceled** - A NAS Cancellation received through an RZ message. A flight cancellation message that arrives from somewhere in the NAS system other than the AOC in charge of the flight.
- **RS Canceled** - an OAG cancellation.
- **RM** - The flight has been removed from the ETMS database.
- **RZ -** A NAS flight plan cancellation message.
- **Timeout Canceled** - A timeout cancellation. This flight has been canceled because its EDT has passed and the flight has not taken off. ETMS determines the necessary lag time between the EDT and the current time before canceling the flight. The amount of time depends upon whether any information was received for the flight (e.g. flight plan).
- **DV Canceled** - This flight has been diverted to a new arrival airport.
- **ID Canceled** - The flight's ID has been changed. In this case, the old flight and ID is canceled and a new flight with a new ID is created.
- **Airline Delayed (ALD**) - This flight has been delayed by its carrier by either an FC Message (create new flights) or and FM Message (modify flights).
- **In Program** - Delayed because of inclusion in a Ground Delay Program.
- **Ground Stopped** - Delayed because of inclusion in a Ground Stop Program.
- **FA Delayed** - A new flight was created in the database after a GDP went into effect. Because this flight has not received any GDP delay, an FA Delay is put on the new "pop-up" flight.
- **Timeout Delayed (TOD)-** A flight's ETD has passed without the flight actually taking off. ETMS bumps the ETD time to account for possible unreported delay. Once the Time Out Delay goes into effect, ETMS then determines the length of time to wait until registering the flight as TO Canceled.

In Ground Delay Tools Mode, an *exemption status* is also given in the Flight Information Window. You will find exemption status above the Flight Status in the Flight Information Window. Exemption status refers to the flight's inclusion in a Ground Delay Operation and will be one of the following:

- **Excluded by Aircraft Type** - The program did not include aircraft of this type.
- **Excluded by Arrival Fix** - The program did not include this arrival fix.
- **Excluded by Arrival Time** - The flight's ETA did not fall within the program time limits.

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- **Excluded by Departure Time (GS Only)** - The flight is canceled or the ETD is before the start time or after the end time.
- **Exempted by Departing Center** - The program did not include this flight's center
- **Exempted by Distance** - The flight is exempted because the departure airport is outside the distance specified by the program
- **Exempted by Departing Airport** - This airport was specifically exempted from the program.
- **Exempted by Specific Flight** - This flight was specifically excluded from the program.
- **Exempted by Departure Status** - The ETD prefix is either A or E
- **Exempted by Departure Time** - The flight's Revised EDCT (or Ptime) comes before the Current Time + Now_Plus.
- **Excluded and Exempted** - Because of program parameters, this flight met excluded and exempted status criteria. This status includes flights which do not fly within the time period of a GDP and which meet exemption criteria.
- **Not Exempted** - This flight is eligible for inclusion in the program.

When one of FSM's alarms is triggered for a flight, FSM generates a list of flights that have triggered an alarm. Alarms are triggered when flights do not comply with certain operations criteria. Alarms are triggered for reasons listed below:

- **CC -** Flights arriving more than 5 minutes before or more than 5 minutes after their Control Time of Arrival.
- **CF -** Flights that were canceled but later flew without the flight being reinstating properly.
- **EA -** The actual flight time is greater than a specified value, but the flight status is not "canceled." The default value is 15 minutes.
- **EC -** The departure boundaries are more than 5 minutes before or more than 5 minutes after their estimated departure clearance time.
- **SF -** Spurious Flights or flights submitted as SI cancellations with no corresponding entries in the OAD.

The term alerts refers to areas in which the traffic demand is projected to exceed a pre-defined capacity threshold. The flight Alerts are listed below:

- **Alerts** > *FADT Parameters Available* – This alert does not actually give you program parameters. Rather, you can view a listing of all the FADTs generated during that day. FADTs are reports generated when a Ground Delay Program, Ground Stops, +/- Delay or Compression operation is run. Note that the FADTs are not always listed in chronological order.
- **Alerts** > *SCS Bridge* This alert turns red in color when there has been a new SCS update. Selecting SCS Bridge will display the current subbing status and may contain the following keywords:

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– **SUBS:** Indicates whether all substitutions are enabled (ON or disabled (OFF))

– **SCS**: Indicates whether slot credit substitutions for all operators are enabled (ON) or disabled (OFF)

– **BRIDGING:** Indicated whether bridging subs are disabled (OFF) for a particular operator (airline name, GA, or MILITARY). If bridging is off for an airline, any flight whose MAJOR field or carrier code (from ACID) matches the airline name will not be used fro an SCS bridge. If bridging is enabled for an operator, no line will appear, that is, the only allowed value for this keyword is OFF.

- **Alerts** > *Actual GDP Parameters Available* **–** This alert turns red in color when Actual GDP Parameters are received through the ADL. First-time GDP Parameters, new GDP Parameters and deleted GDP Parameters will all trigger this Alert. Click Actual GDP Params Updated to view the parameters in the GDP Parameter Display panel, which is similar to the GDP Setup Panel. From the GDP Parameter Display panel, you may save the parameters or close the panel.
- **Alerts** > *Proposed GDP Parameters Available* **-** This alert turns red when parameters for a Proposed GDP arrive through the ADL. Click Proposed GDP Parameters to view the new parameters.
- **Alerts** > *GS Parameters Available* – This alert turns red in color when a Ground Stop is issued and its parameters are received through the ADL. First-time GS Parameters, new GS Parameters and deleted GS parameters will all trigger this Alert. Click GS Parameters to view the parameters in the GS Parameter Display panel, which is similar to the GS Setup Panel. From the GS Parameter Display panel, you may save the parameters to a file or close the window.
- **Alerts** > *Compression Parameters Available* **–** This alert is triggered when parameters for the compression function are received through the ADL. When Compression parameters arrive, Compression Parameters turns red in the Alert menu. Click the red text to view the new parameters.
- **Alerts** > *Blanket Parameters Available* **-** This alert is applied to all flights that are part of a specific ground delay program.

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Appendix B: FSM 7.8 Algorithms

This section illustrates FSM Algorithms in detailed flow chart format. The FSM Algorithms include Rationing By Schedule (RBS++), Compression, "+/- Delay", Ground Stop, Purge, and Airborne Holding. In addition, the Compression Algorithm calls on four subset algorithms: Intra-airline Compression, Inter-airline Compression (Substitution), Compress Flight, and Move Up a Flight. Sub-section 7: C.1contains a list of common terms used throughout the FSM Algorithms. Sub-sections C.2- C.7 include each FSM Algorithm's flow chart.

C.1 Common Terms

Auto-Delay Algorithm:

This is the set up for Compression, which takes into account the Earliest Runway Time of Arrival (ERTA).

Effective AAR:

AAR minus GA Factor.

ETE:

ETE = max ((ETA – ETD), (CTA – CTD)) if configured to use Max ETE.
ETE = ETA – ETD if configured to use ETE.

Excluded Flight:

A flight that does not meets the criteria of being included in a GDP. These criteria include factors such as the flights IGTA – taxi being outside the program start/end time, affix, and removal status.

Exclude_and_Exempted Flight:

A flight whose ETA is later than the program start time, is excluded from the program, and meets program exemption criteria such as exempt airport, departure time, or status.

Exempt Flight:

Airborne Flights, departing within Now Plus parameter, specific spatial constraints and any flight that meets the criteria of an "exempt flight" within the algorithm. An exempt flight's ETD will not receive delay. Exempt flights receive first priority during RBS++.

Floor_Time:

The Floor_Time of an open slot is the ETA of its associated flight, or 9999 if its associated flight is cancelled. This results in open slots associated with canceled flights being processed first.

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Non-Exempt Flight: (2 types)

- Previously Controlled: Have second priority behind exempt flights during RBS++. These flights are ordered by their ASLOT.
- Non-previously Controlled: Have third priority during RBS++. These flights are ordered by IGTA, but may have to sort by ASLOT.

Open_Slot:

An open slot is created when a flight is canceled or delayed, so all open slots have one and only one associated flight. This is an association that never changes. An open slot due to delay (at least one of the delay flags is set in the flight record) is created if its associated flight's ETA is later than where the open slot will be displayed on the time line, which is at either (1) Wheel_Arrival_Time if the flight doesn't have a slot, or (2) its slot time if the flight has a slot.

Plus_Time:

Value entered by the FSM user when implementing a GDP. The Plus_Time determines the buffer past the data time in which flights will not be delayed. This is to insure that flights that are already boarding are not issued a delay.

Slot_Hold:

Slot_Hold is a status that is applied to an Open_Slot so that it is not filled by the compression process. A NAS user normally holds slots when they intend to use a slot but have not yet determined which specific flight will be moved to fill that slot. A slot can also be held by ETMS when a flight is timeout or NAS canceled.

Slot_Time:

The time position of airport capacity allocated to a NAS user, this is the time that the users flight should target for its arrival. The Slot_Time is used to create the Slot Identification, which is a combination of the arrival airport, the slot time, and a suffix to differentiate multiple slots issues for the same minute.

Virtual slot time:

Based on 15-minute effective AAR. The smallest slot time increment is one minute.

Wheel_Arrival_Time:

The arrival time used for rationing airport capacity. The IGTA is set by ETMS based on the first information received for that flight. The IGTA will be set to SGTA, LGTA, or PGTA depending on which is the first value receive by ETMS. IGTA is then adjusted for taxi-in time to determine the Wheel_Arrival_Time.

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C.2 Rationing by Schedule (RBS++) Algorithm

For "Ground Delay Program (GDP)"

This function requires the following input parameters:

a. Start_Time = t0
b. End_Time = t1
c. Data_Time
d. Included_AFIX
e. Included Aircraft Type
f. Included Carrier
g. Delay_Ceiling
h. GDP Operation (RBS++ for this writing)
i. AAR Values (for each 15 minutes time period)
j. GA_Factor (per hour)
k. Options for flight exemption from the departure end - by Departure_Time or by Departure_Status. Plus_Time in minutes indicates how many minutes from the data time should be used for this exemption; if exempt by departure status, Plus_Time is set to zero.
l. Option for ground stopped (GS) flight exemption - whether to exempt GS flights by their departing status or not.

> **Note:** This option is unnecessary if user have already selected "exempt by status" in item *(k)*.

m. Specific_Flight_Exemption.
n. Specific Departure Airport Exemption.
o. Facilities (departing centers and airports) involved.
p. Last GDP Ending Time.
q. Carriers/GA flights whose slot holding status is to be overridden.

Step 1

Find all arrival flights included in the program.

↓

Set Wheel_Arrival_Time = IGTA - taxi. IF the IGTA of the flight has no value, use the following fields in the listed order:

- SGTA – taxi
- LGTA – taxi
- PGTA – taxi
- BETA (ETMS ETA)

↓

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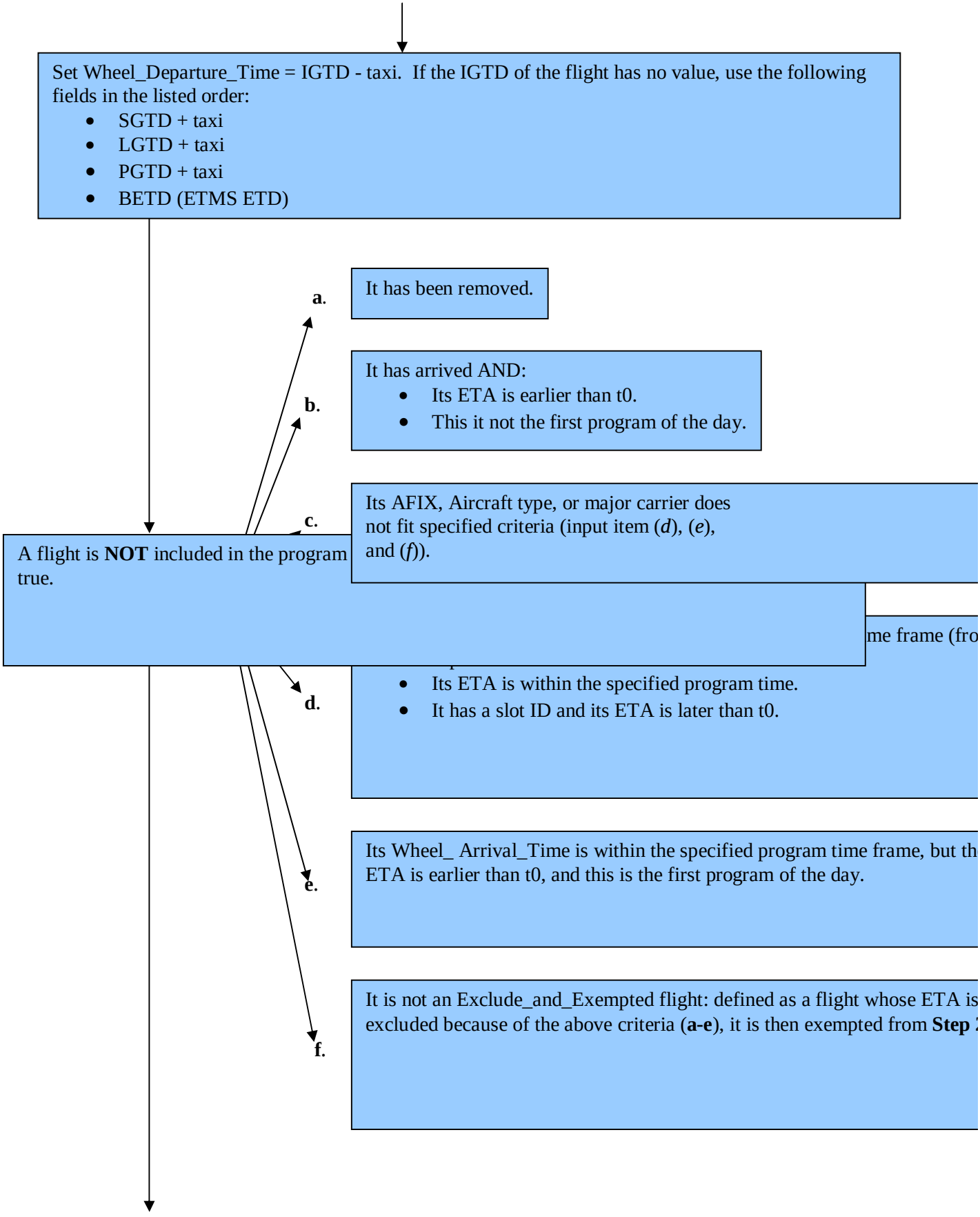

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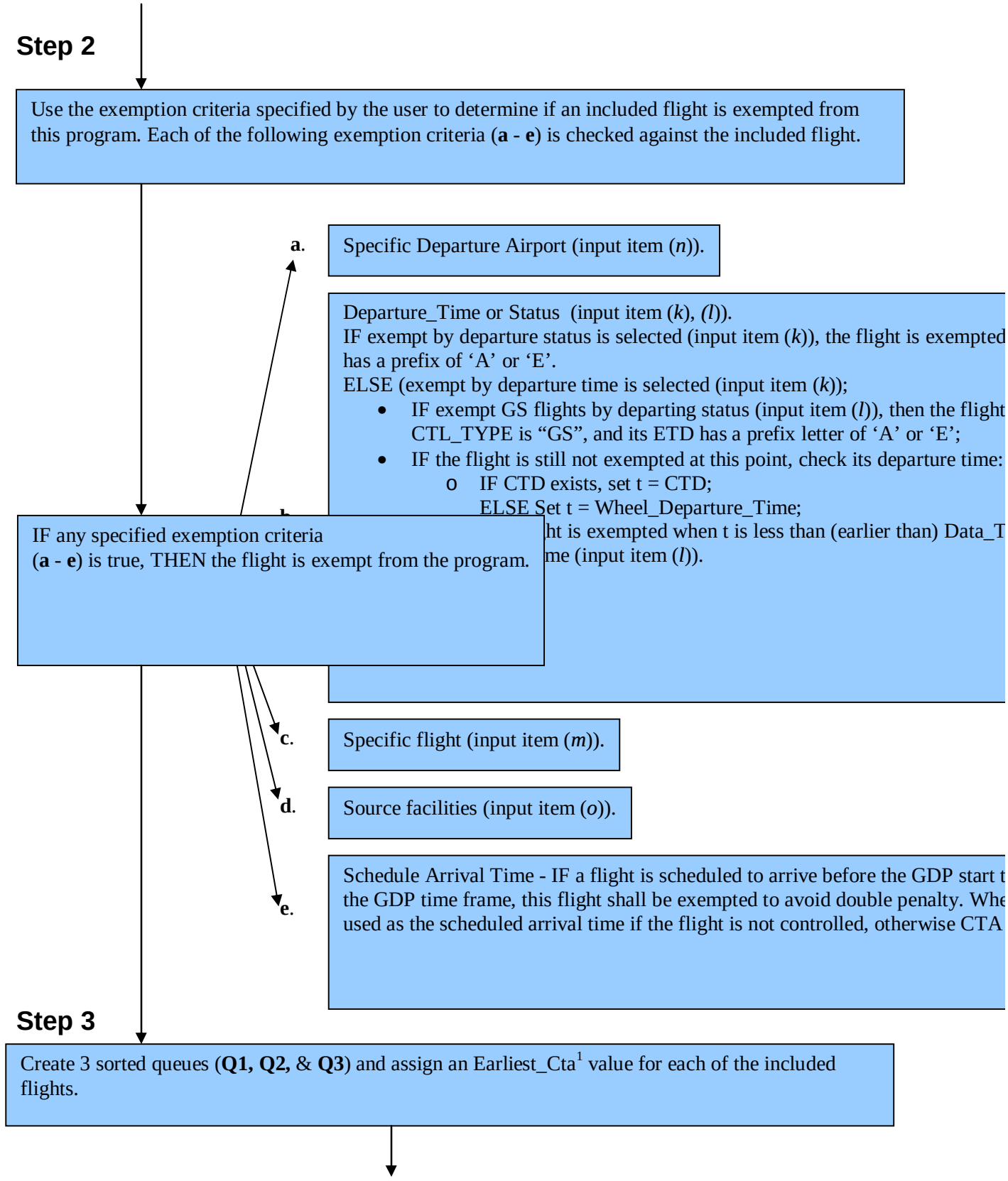

[1] Earliest_Cta is a temporary value for each flight to indicate the earliest time the flight's new Controlled Time of Arrival (CTA) can be.

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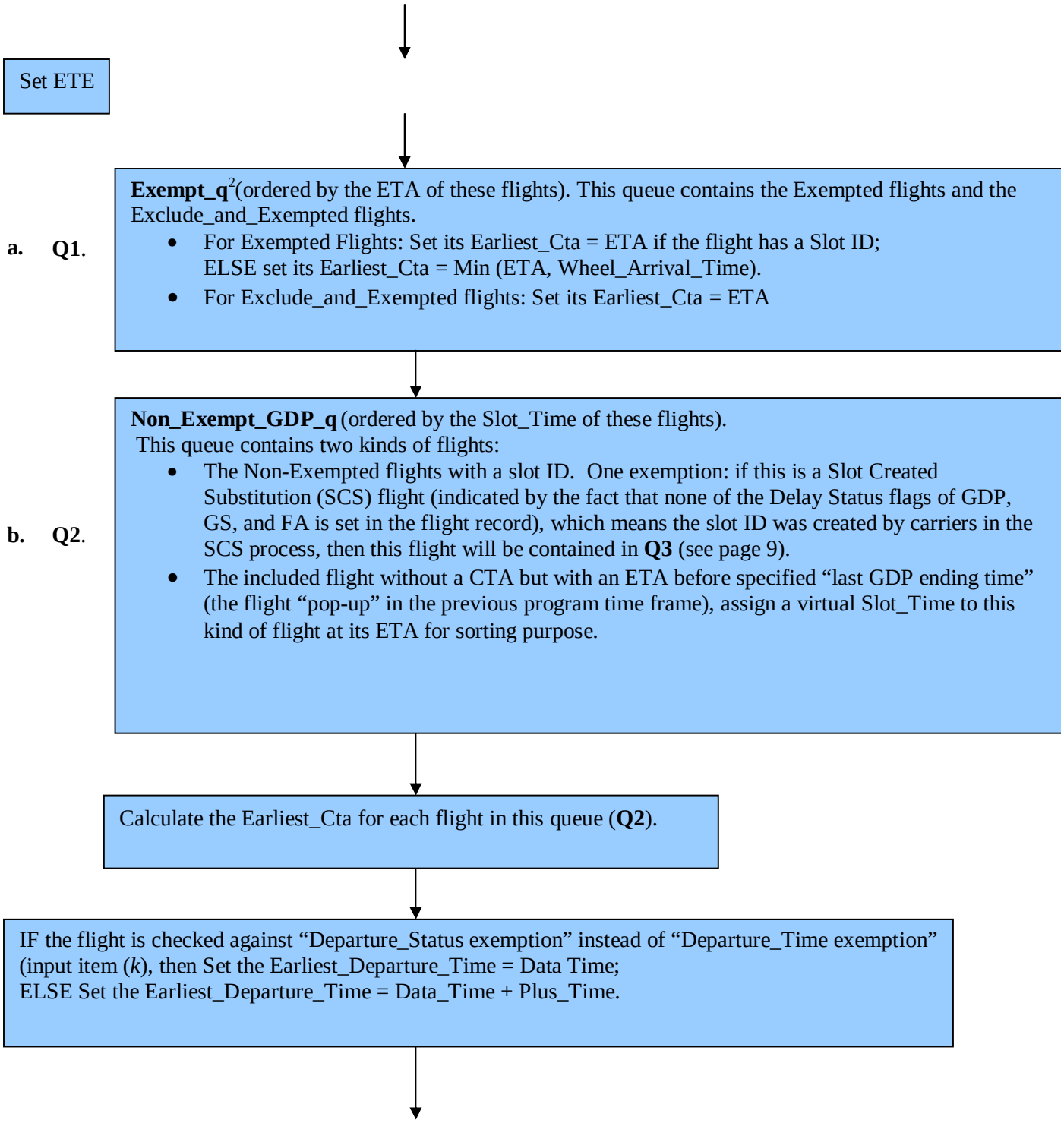

[2] Q1 is sorted by ETA to maintain the current flight arrival order.

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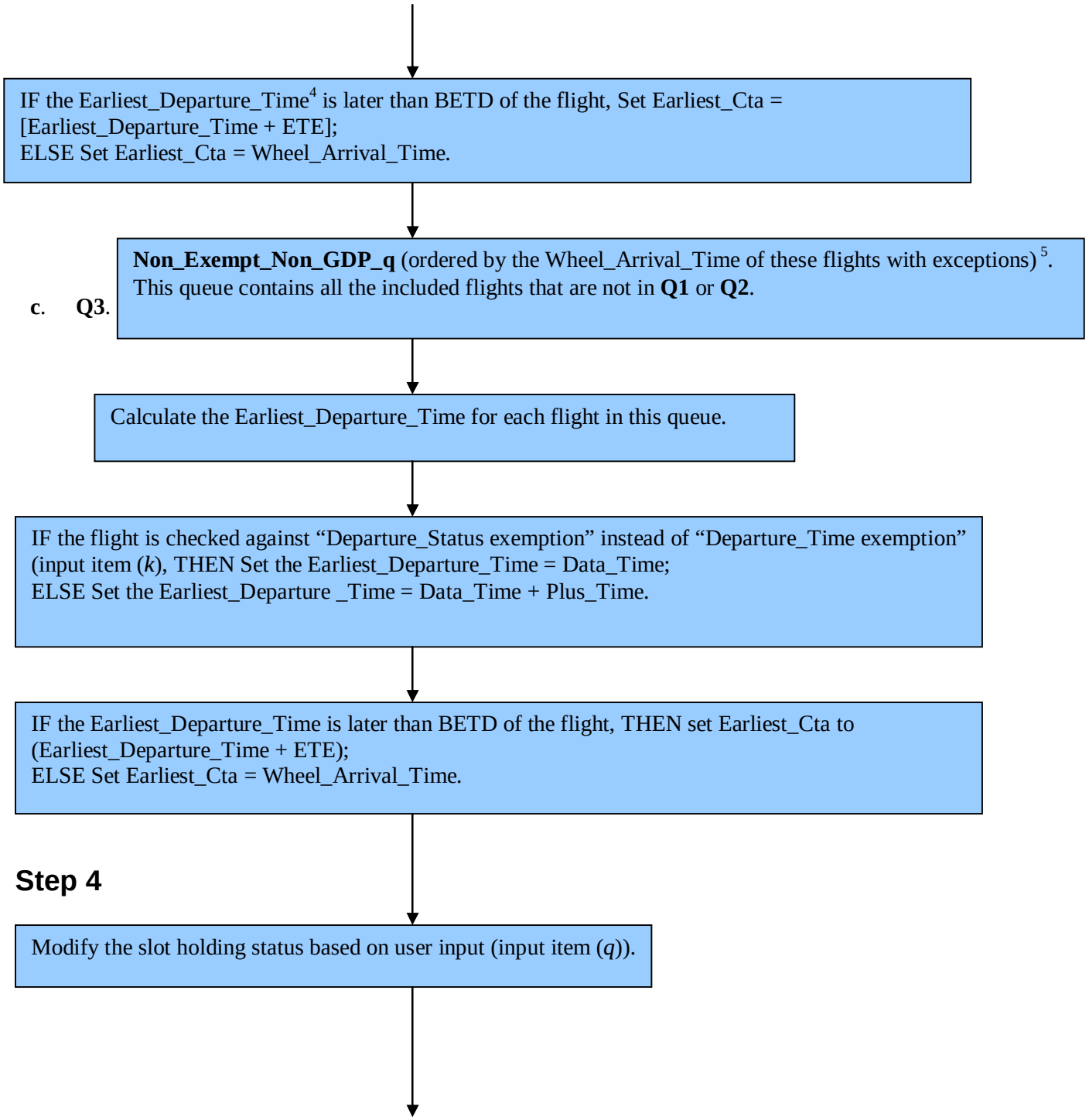

[4] Earliest_Departure_Time = Data_Time for the GS flight whose exemption status is checked against Departure_Status and Data_Time + Plus_Time for all other flights.
[5] Q3 uses CTA for ordering Slot Creit Substitution (SCS) flights, use Wheel_Arrival_Time for all other flights in Q3.

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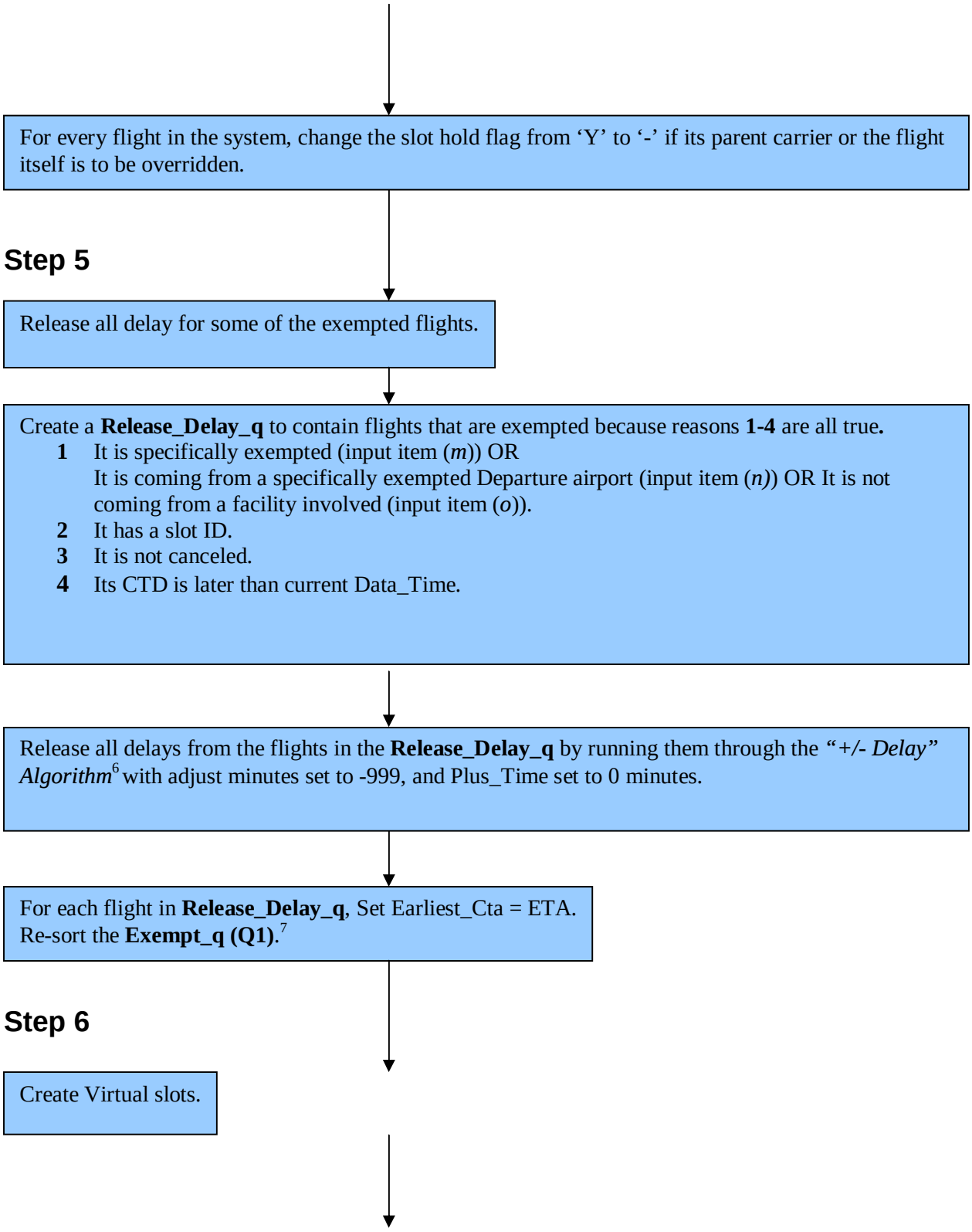

[6] See "+/- Delay" Algorithm (page 367)
[7] The two statements contained in this box are necessary since ETA of some flights is modified by this step of delay releasing..

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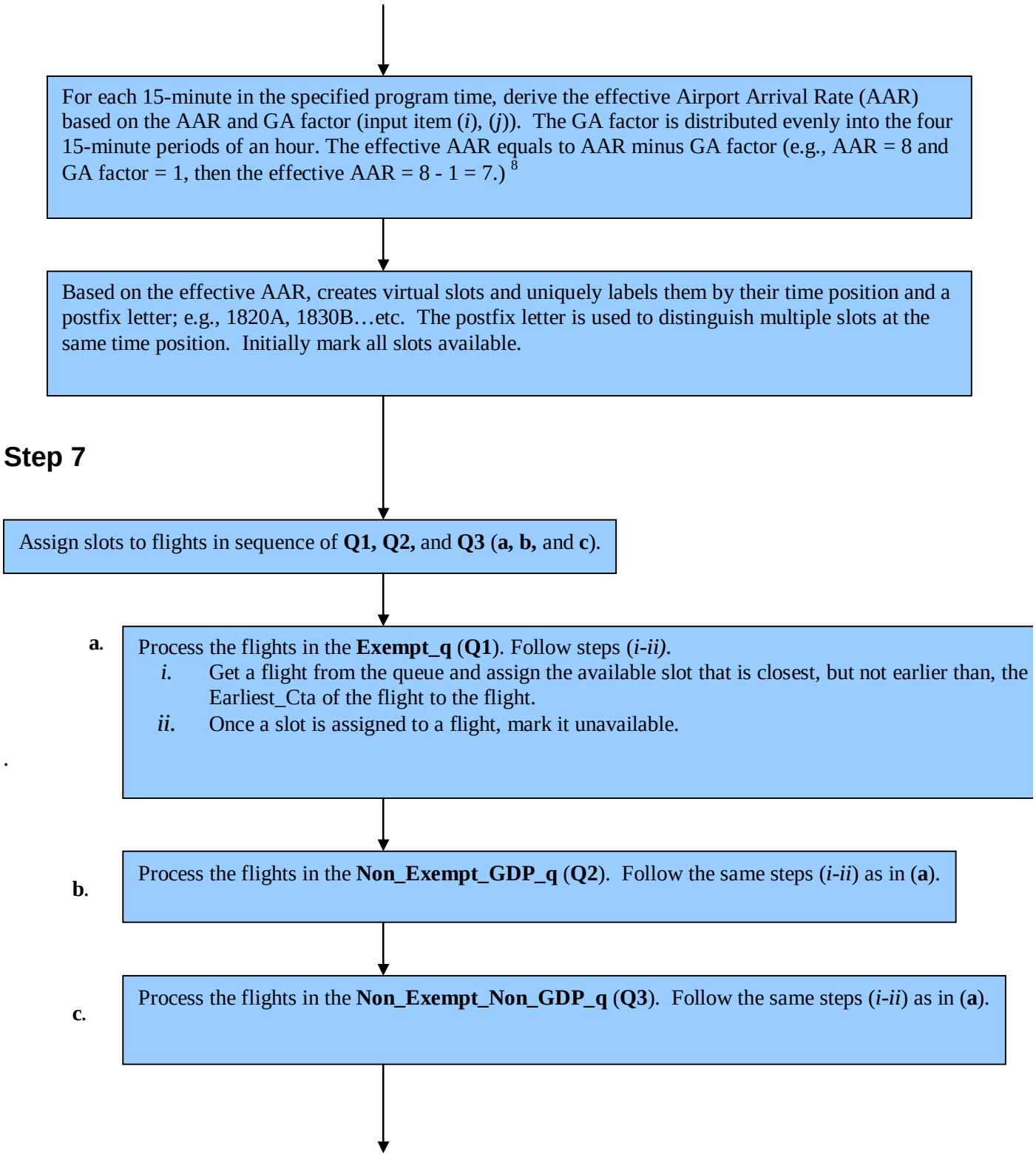

[8] The effective AAR calculation only applies to the hours in the GDP period. For the hours outside of the GDP period, effective AAR = specified AAR.

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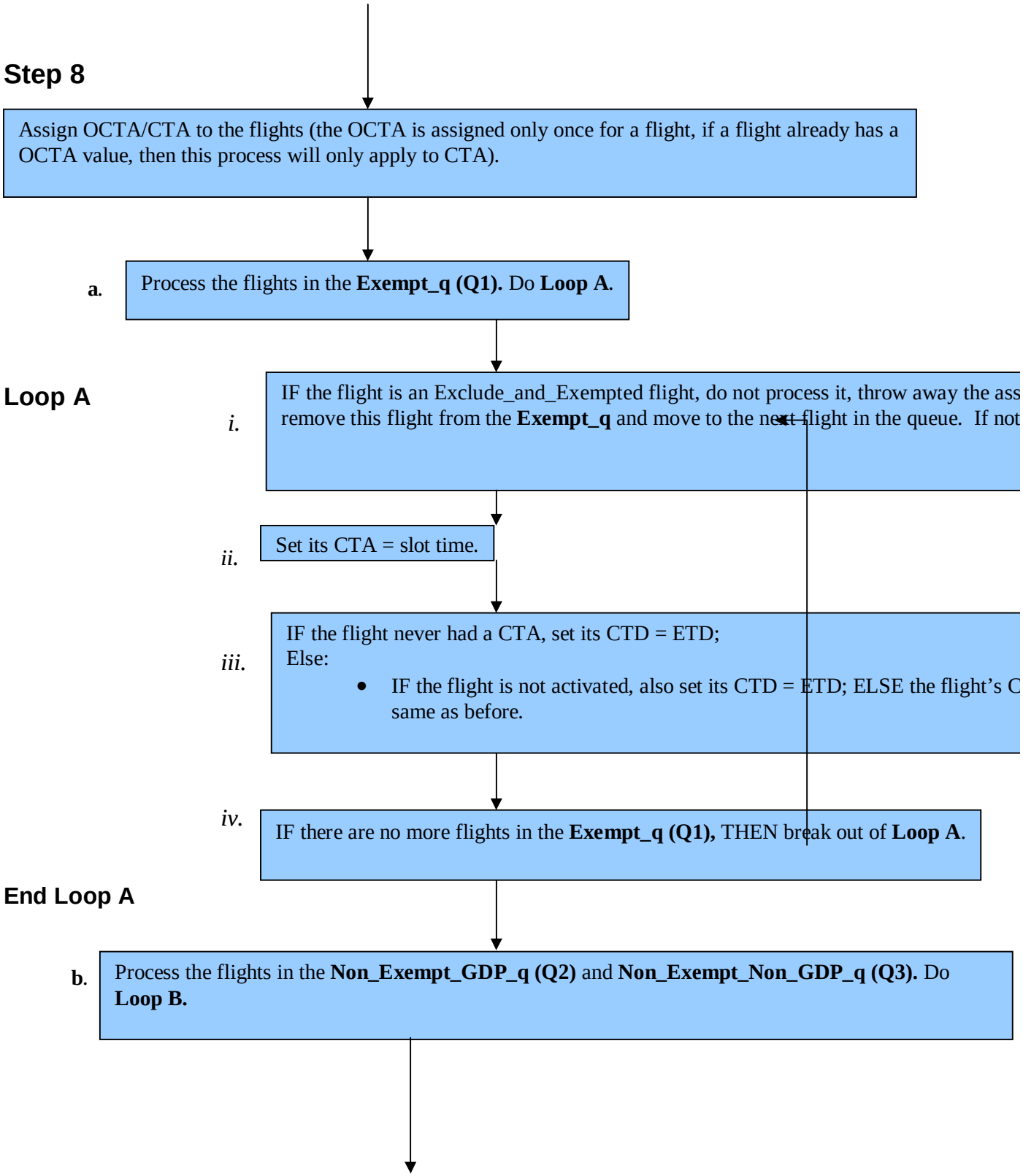

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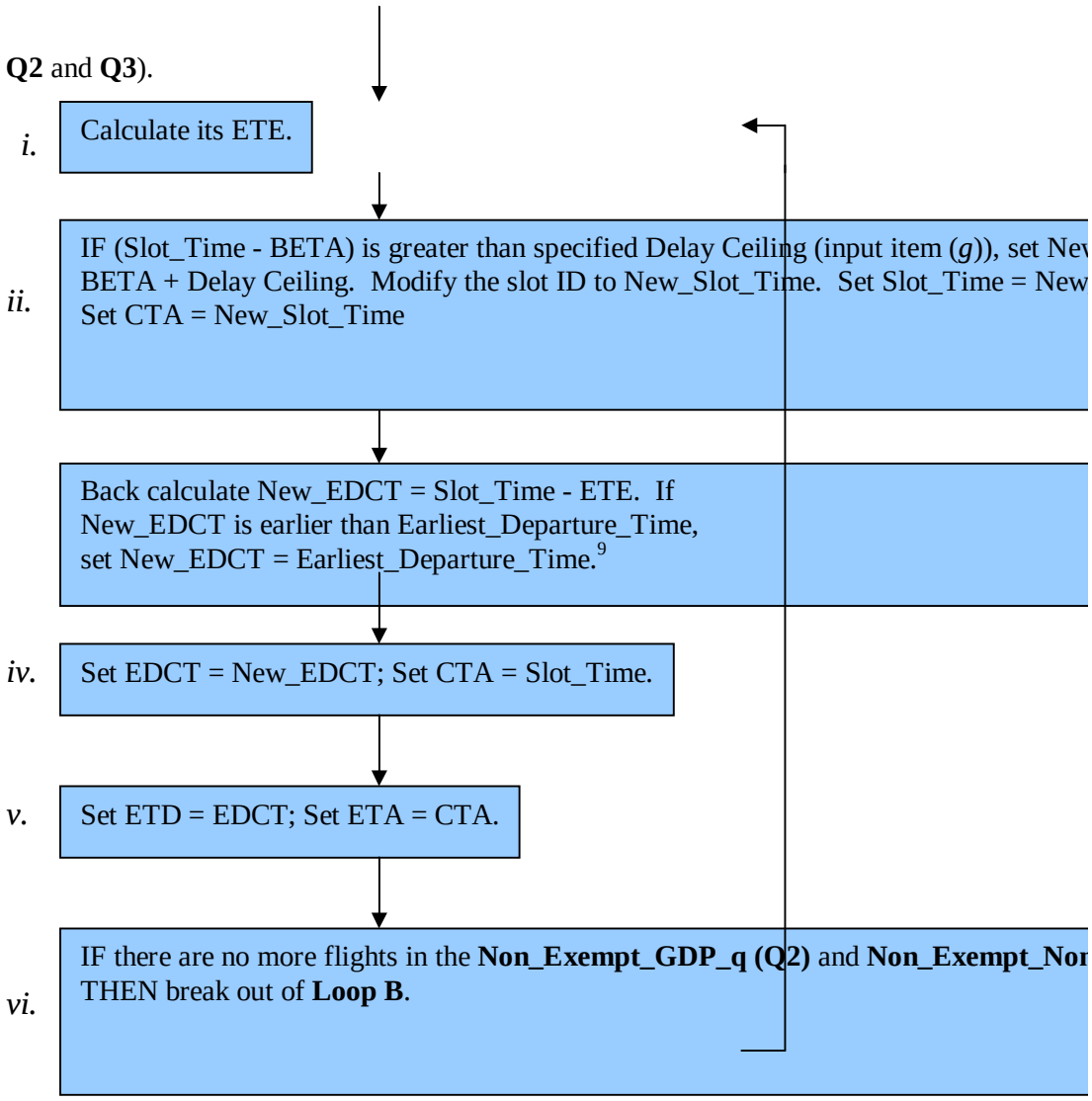
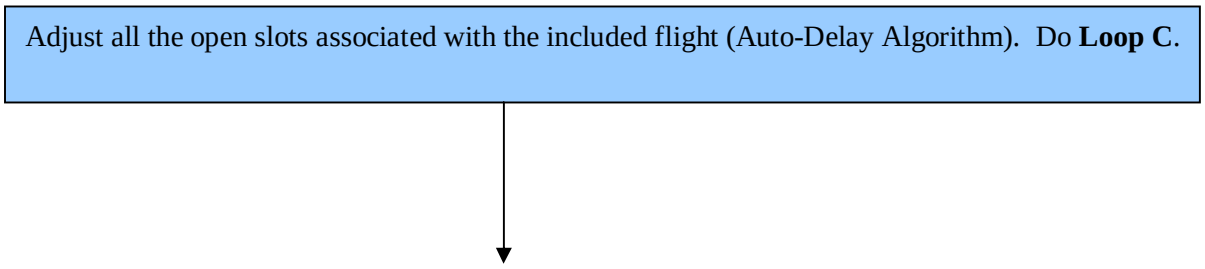
Loop B

(For each flight in queue **Q2** and **Q3**).



End Loop B

Step 9



[9] The Earliest_Depart_Time is defined as the data time for the GS flight whose exemption status is checked against departure status, and [data time + Plus_Time] for all other flights.

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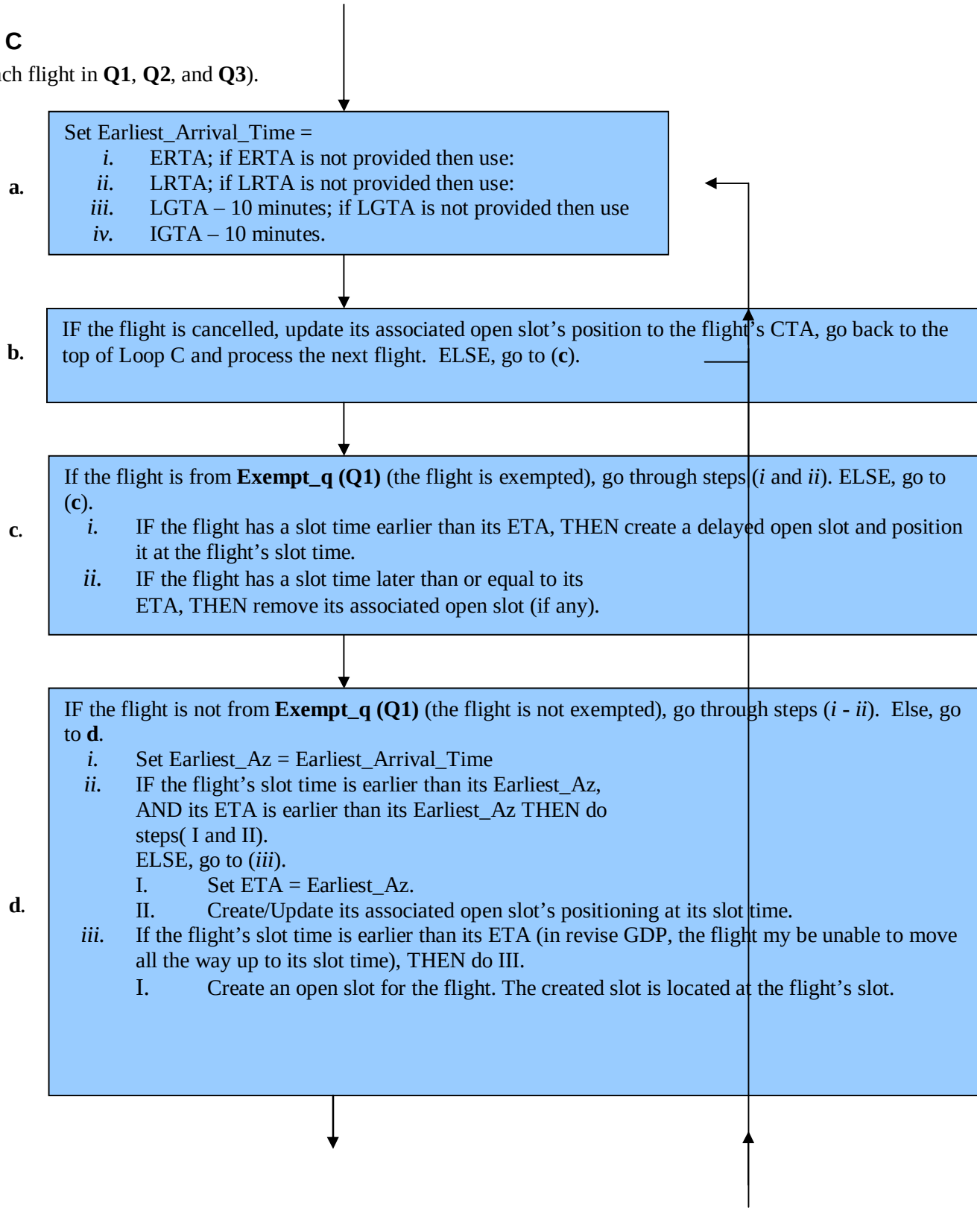
Loop C

(For each flight in **Q1**, **Q2**, and **Q3**).



[10] In revise GDP, the flight may be unable to move all the way up to its slot time.

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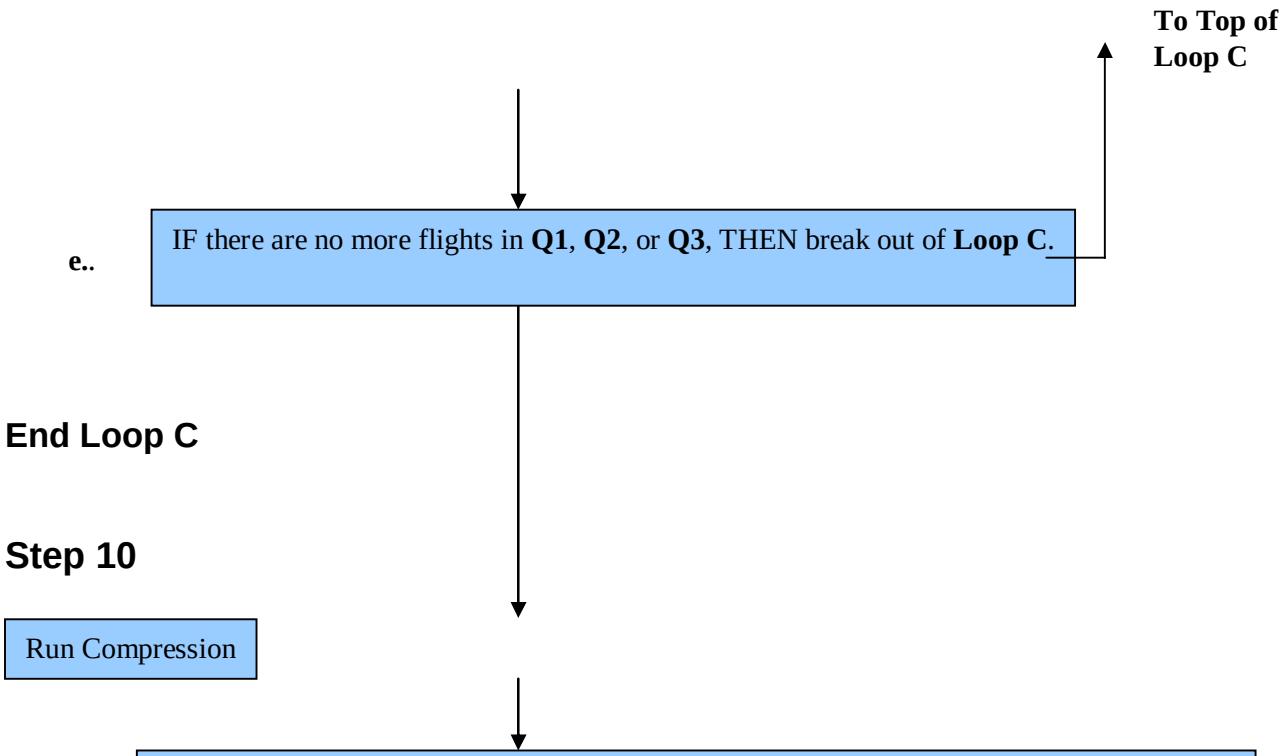

End Loop C

Step 10

Run Compression

a. Run Compression (See *Compression Algorithm*[10]) with the following parameters (1 - 5).

1. Start_Time = GDP start time.
2. End_Time = GDP end time.
3. Slot holding carrier override = None (already considered in GDP algorithm Step 4).
4. Window_Parameter = 0.
5. Data_Time = GDP Data_Time.

End of RBS++ Algorithm

[11] See Compression Algorithm (page 351)

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C.3 Compression Algorithm

("Prioritize Member")

This Function requires the following input parameters:

a. Start_Time = t0
b. End_Time = t1
c. Slot_Holding_Carrier_Override(s)
d. Window_Parameter (default = 0)
e. Data_Time
f. Minimum_Move_Up_Time

Step 1

Modify the slot holding status based on user input (input item (*c*)).

IF a flights parent carrier or the flight itself is optioned to be overridden, THEN change the Slot_Hold_Flag from 'Y' to '-' for every flight in the system.

Step 2

Find all eligible open slots for Compression. (for both pure compression operation and compression with RBS++) An eligibility check of an open slot is as follows; All conditions (**a**-**c**) must be met:

- **a** Time of Slot_Time is between t0 and t1.
- **b** Its associated flight has a slot ID (the Open_Slot is displayed in a solid color).
- **c** Its associated flight is not a pop-up flight (Ctl_Type = FA).

After passing the above 3 conditions, the Open_Slot is eligible if its associated flight is a GA / Military flight, check IF its associated flight is canceled and the Slot_Hold_Flag is on, which makes the open slot ineligible.

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Set Wheel_Arrival_Time = IGTA - taxi. IF the IGTA of the flight has no value, use the following fields in the listed order below:

- SGTA – taxi
- LGTA – taxi
- PGTA – taxi
- BETA (ETMS ETA)

Step 3

Put these open slots in an Open_Slot_queue (**Osq**) from **Step 2**; sorted in reverse order by their Floor_Time.

Step 4

Find all arrival flights eligible for Compression. A flight is eligible if all conditions (**a**-**f**) are met.

a It is not canceled.
b It has a slot ID.
c It is not a pop-up flight (Ctl_TYPE = FA).
d Its ETA is later than or equal to t0.
e It is not active
f Its ETD is later than or equal to the Earliest_Departure_Time of all flights.

- For *pure compression* – The Earliest_Departure_Time is Data _Time + 30 minutes.
- For *Compression within RBS++* - The Earliest-Departure_Time is calculated in RBS++ algorithm Step **3** (b) (i.e. If the flight is checked against "departure status exemption" instead of "departure time exemption" (input item (*k*) in RBS++ algorithm), set the Earliest_Departure_Time = Data_Time; ELSE set the Earliest_Departure_Time = Data_Time + Plus_Time.)

Step 5

Put the eligible flights in a flight queue (**Fq**), sorted by their ETA.

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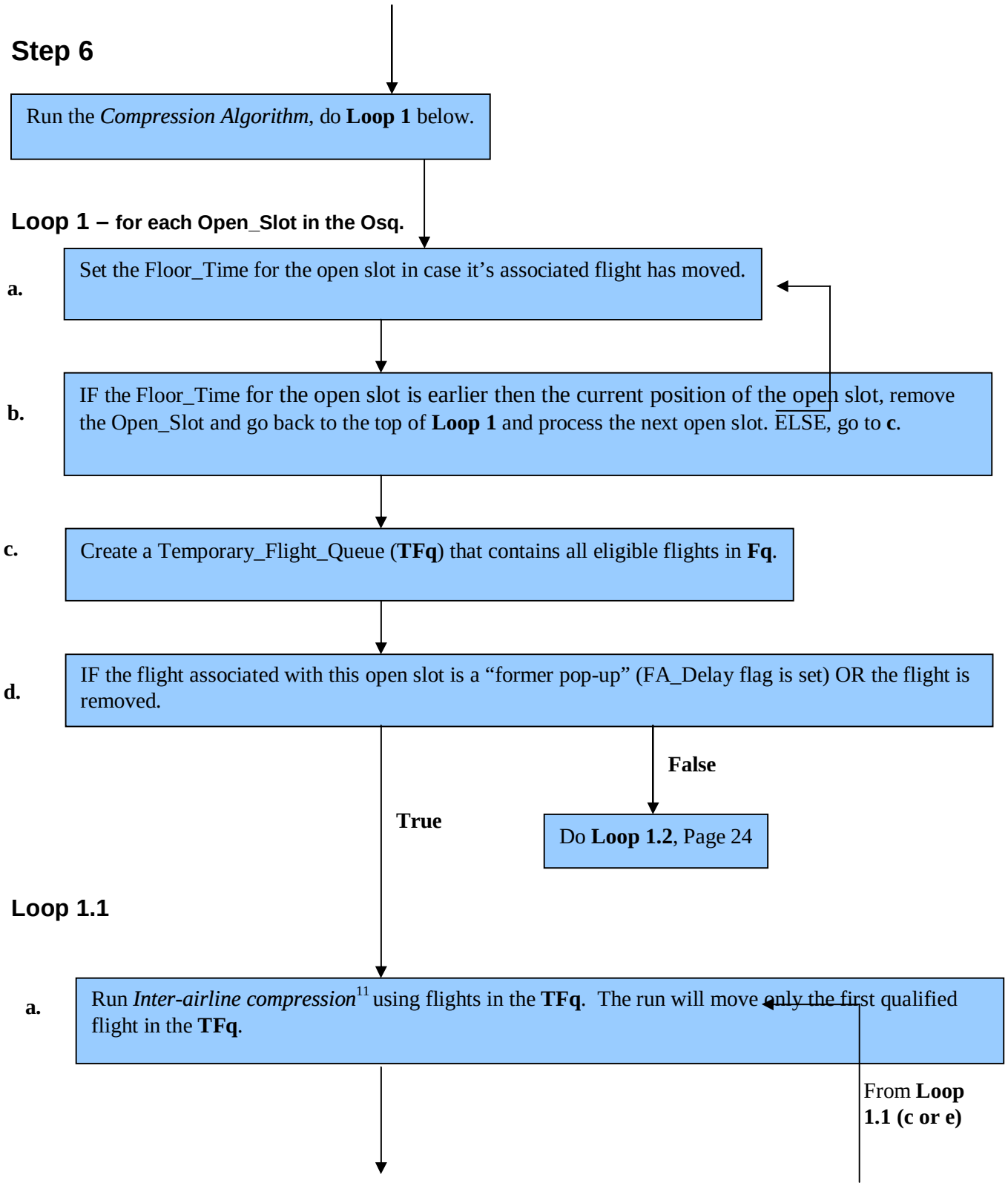

[12] See "Inter-airline Compression (for one open slot)" (page 361)

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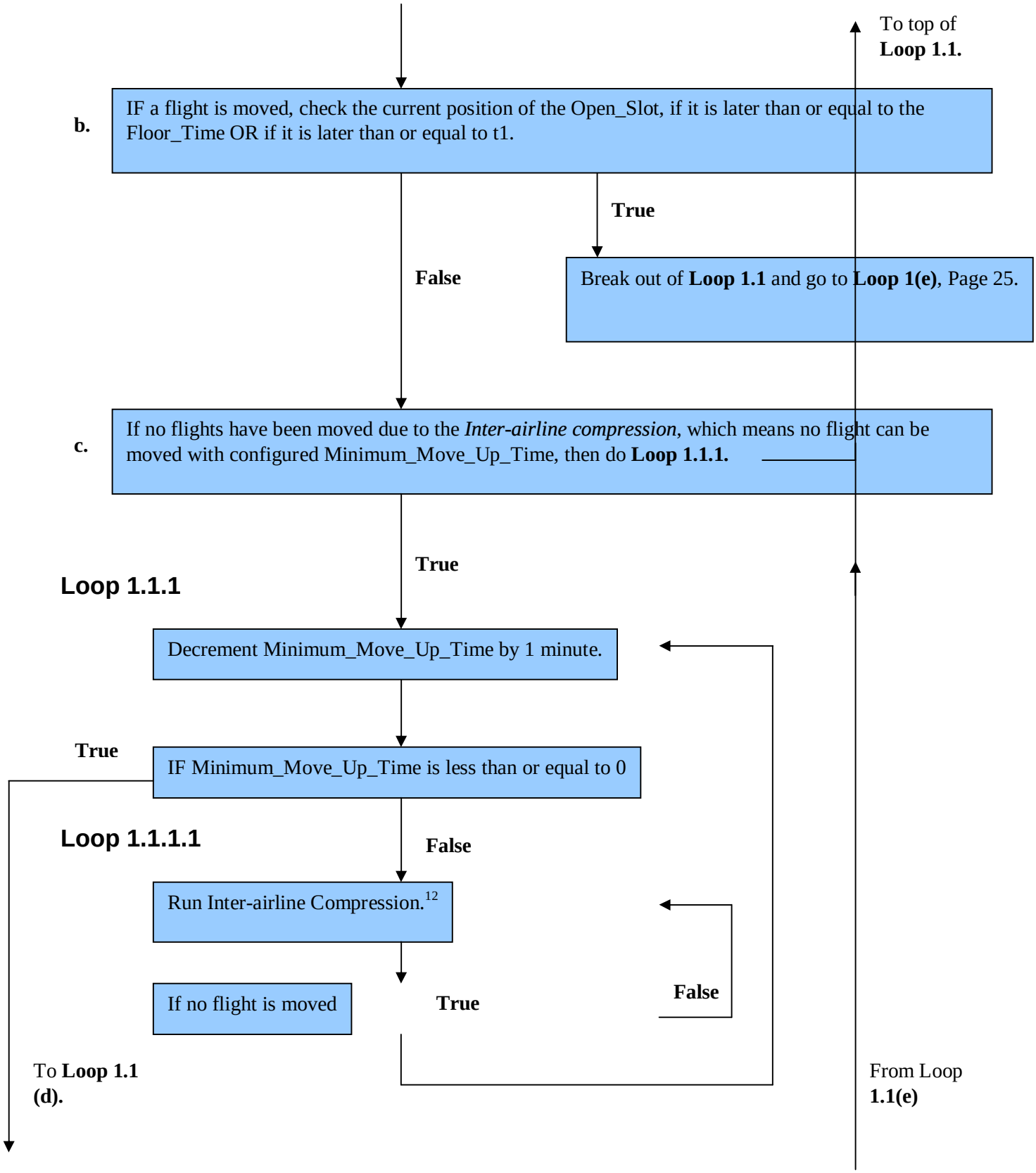

[13] See "Inter-airline Compression (for one open slot)" (page 361)

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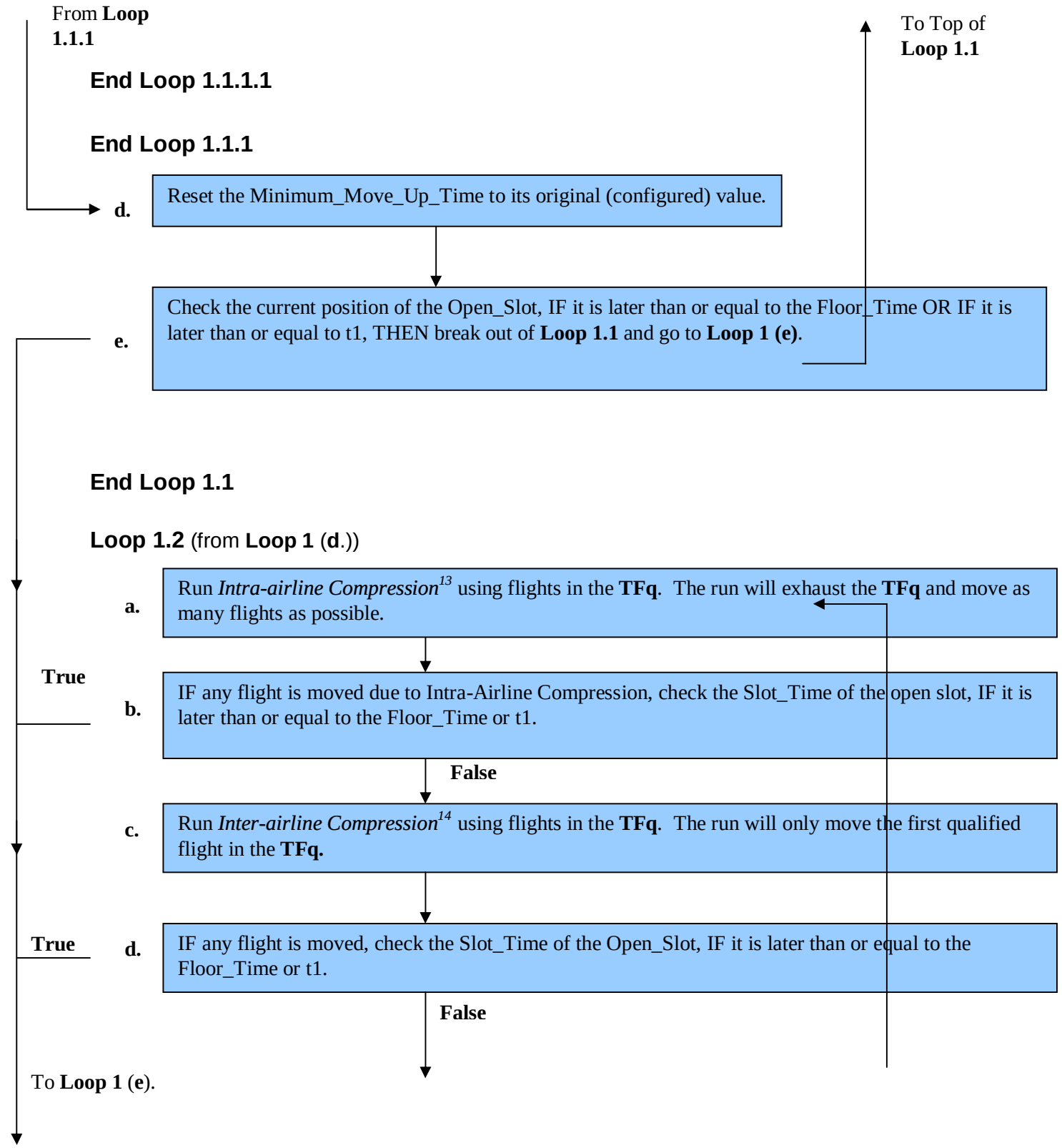

[14] See "Intra-airline Compression (Substitution) Algorithm (for one open slot)" (page 359)
[15] See "Inter-airline Compression (for one open slot)" (page 361)

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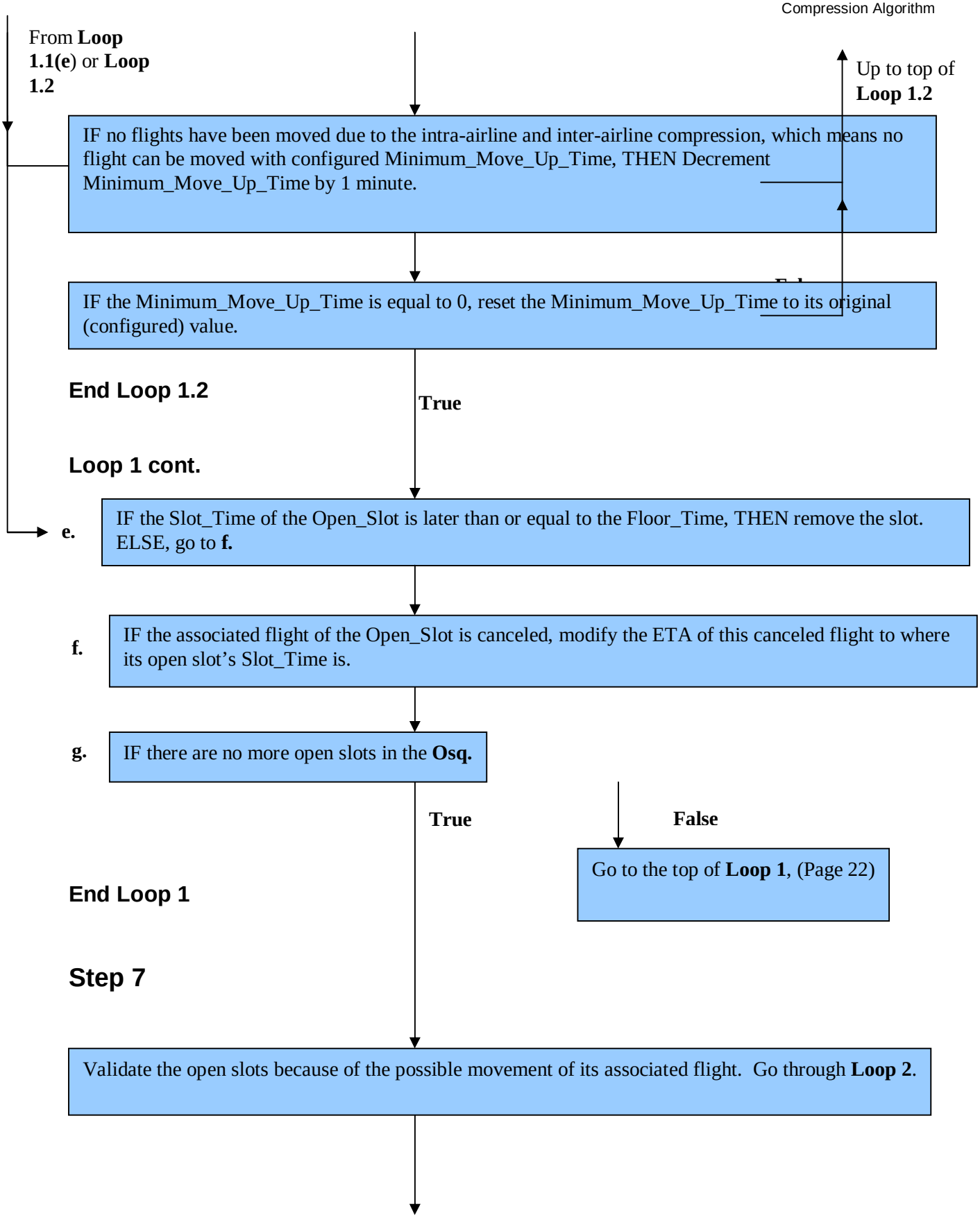

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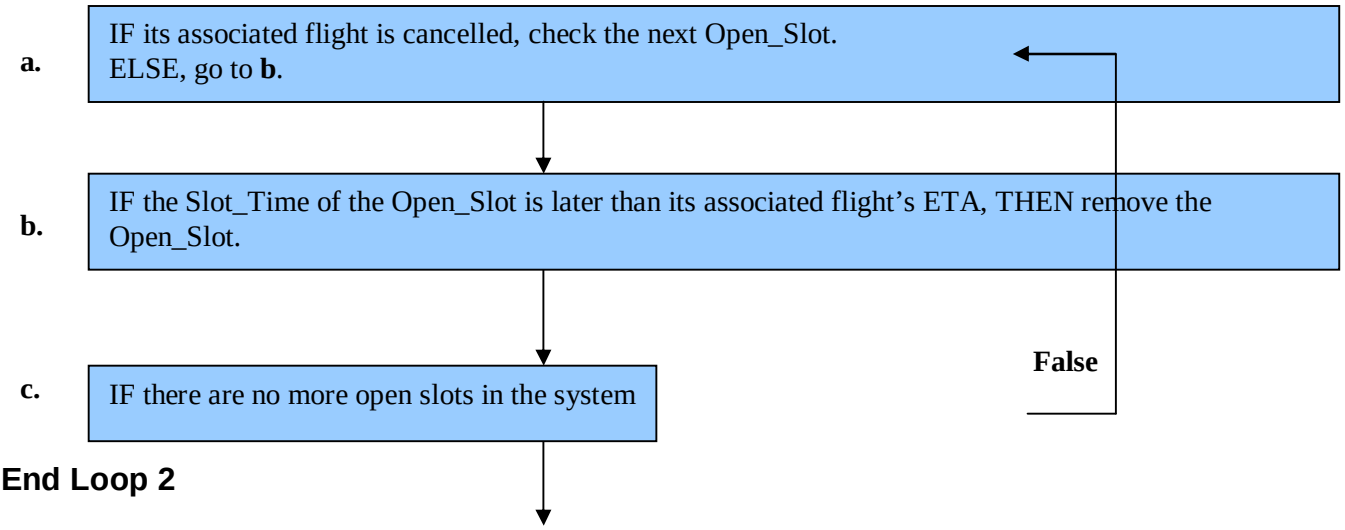
Loop 2- for each Open_Slot in the system



End Loop 2

End of Compression Algorithm ("Prioritize Member")

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C.3.1 Intra-airline Compression Algorithm

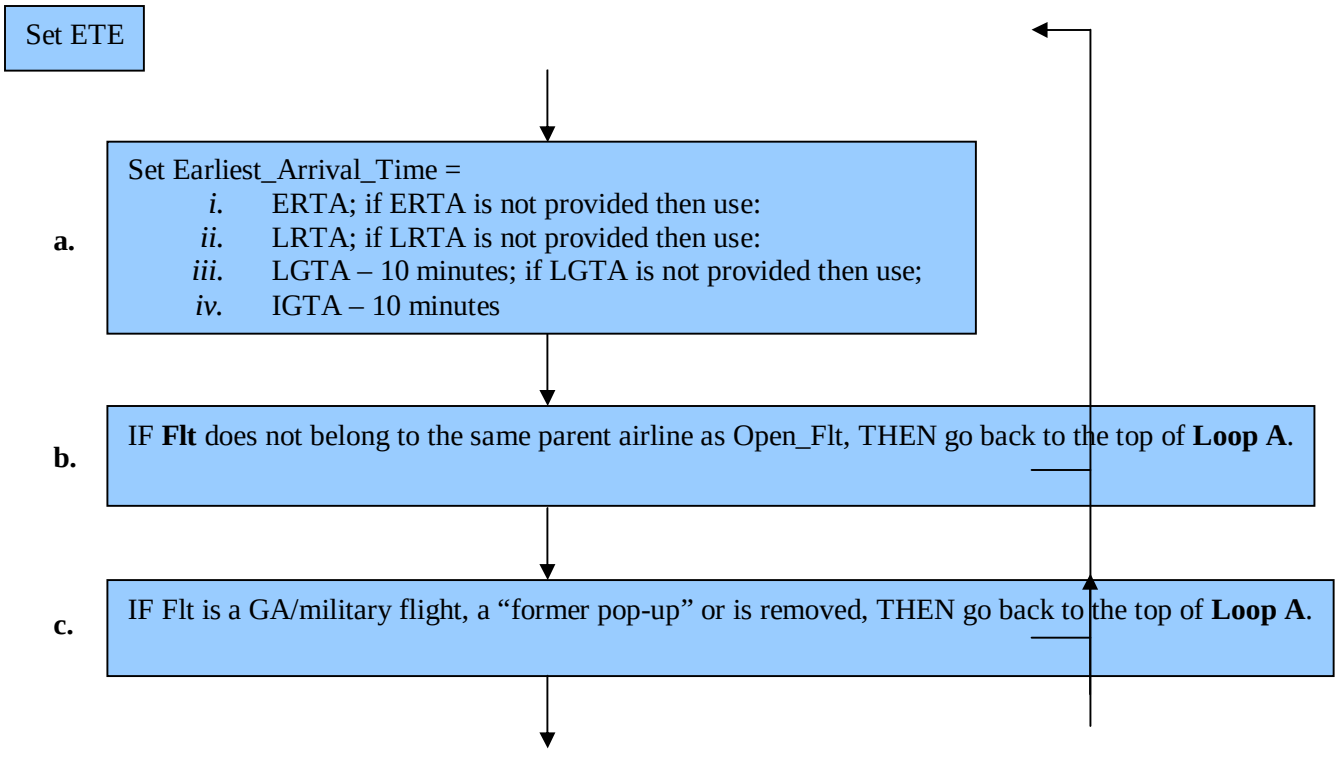
(For one open slot)

This Function requires the following input parameters:

a. An Open_Slot
b. A flight record (Open_Flt), which is associated with Open_Slot.
c. The flight queue (**TFq**) containing all eligible flights for Substitution.
d. Earliest_Departure_Time. For pure compression, the value of this field equals to Data Time + 30 minutes; For compression within RBS++, the value of this field is calculated in RBS++ algorithm **Step 3(b)**.
e. Window_Parameter
f. Minimum_Move_Up_Time

If the Open_Flt is a GA/Military flight, a former pop-up flight, or is removed, then break out of this function (intra-airline compression does not apply to open slots associated with those flights).

Loop A – for each flight in the **TFq,** say **Flt**.



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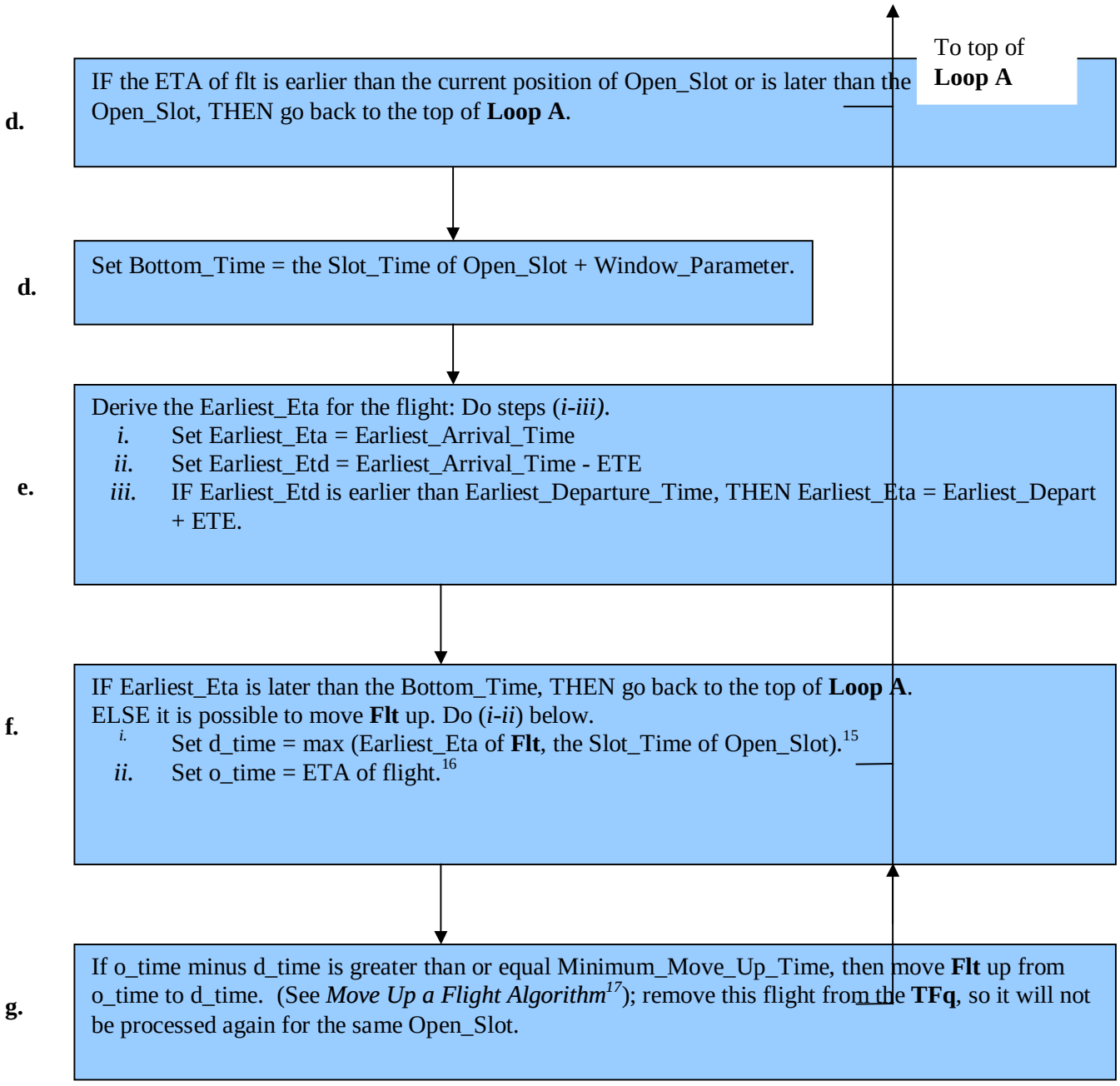

End Loop A

End Intra-Airline Compression Algorithm

[16] d_time is potentially where flight ends up.
[17] o_time is where flight is at.
[18] See Move Up a Flight Algorithm (page 365).

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C.3.2 Inter-airline Compression Algorithm

("Prioritize Member" for one open slot)

This function requires the following input parameters:

a. An Open_Slot.
b. A flight record (Open_Flt), which is associated with Open_Slot.
c. The flight queue (TFq) containing all eligible flights for Compression.
d. Window_Parameter.

Loop B

Step 1

Run *Compress Flight Algorithm*[18] **with member-only option**. The run will move only the first qualified flight in the **TFq**. If a flight is moved due to this member-only compression, return.

Step 2

Run *Compress_Flight Algorithm*[19] **with non member-only option**.

End Loop B

End of Inter-airline Compression Algorithm

[19] See "Compress Flight Algorithm" (page 363)
[20] See "Compress Flight Algorithm" (page 363)

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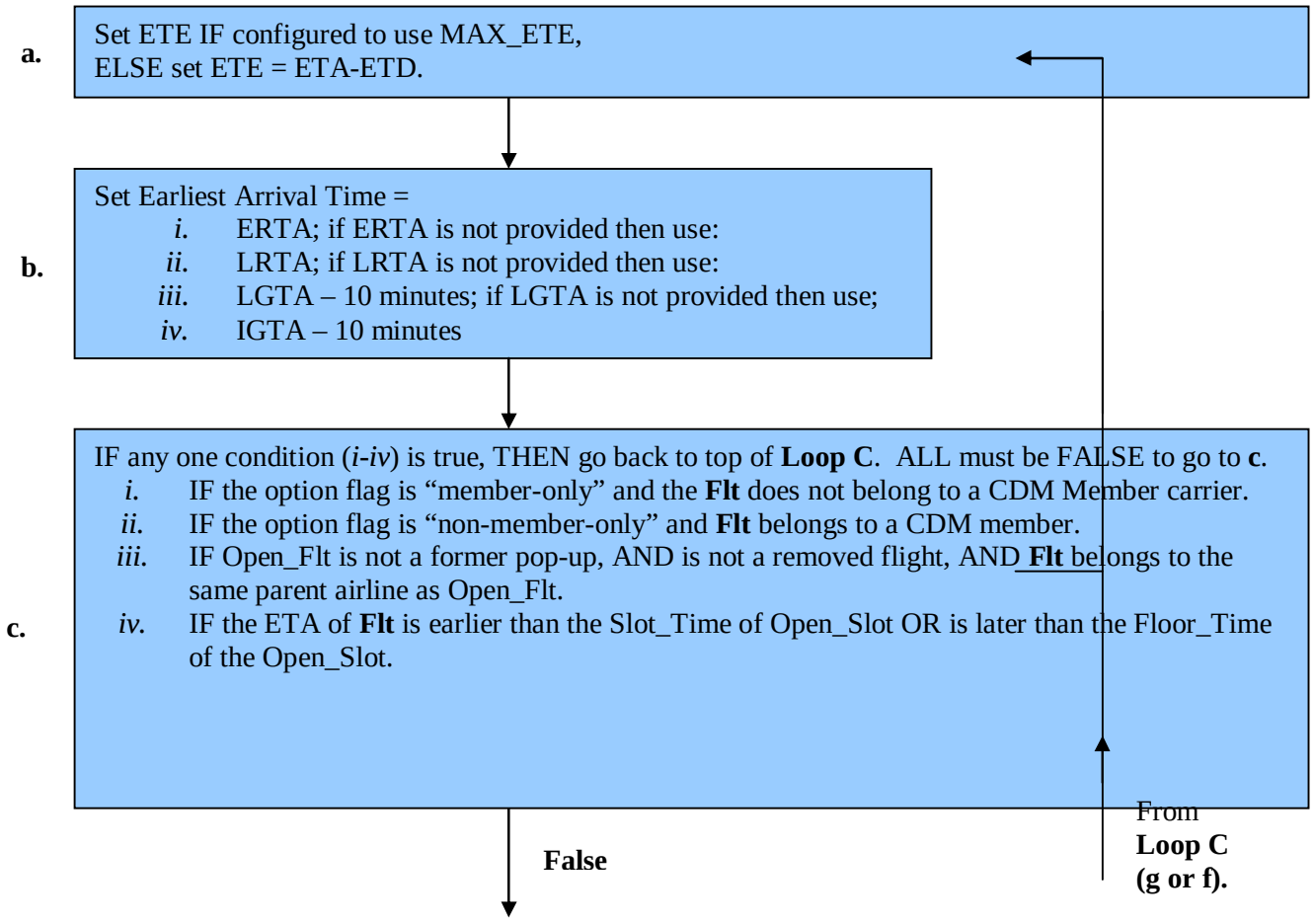
C.3.3 Compress Flight Algorithm

This function requires the following input parameters:

a. An Open_Slot.
b. A flight record (Open_Flt), which is associated with Open_Slot.
c. The flight queue (**TFq**) containing all eligible flights for Compression.
d. Option_Flag of "member-only" or "non-member-only".
e. Earliest_Departure_Time. For pure compression, the value of this field equals to Data_Time + 30 minutes; For compression within RBS++, the value of this field is calculated in RBS++ algorithm **Step 3(b)**.
f. Window_Parameter.
g. Minimum_Move_Up_Time.

Loop C

For each flight in the flight queue, say **Flt**.



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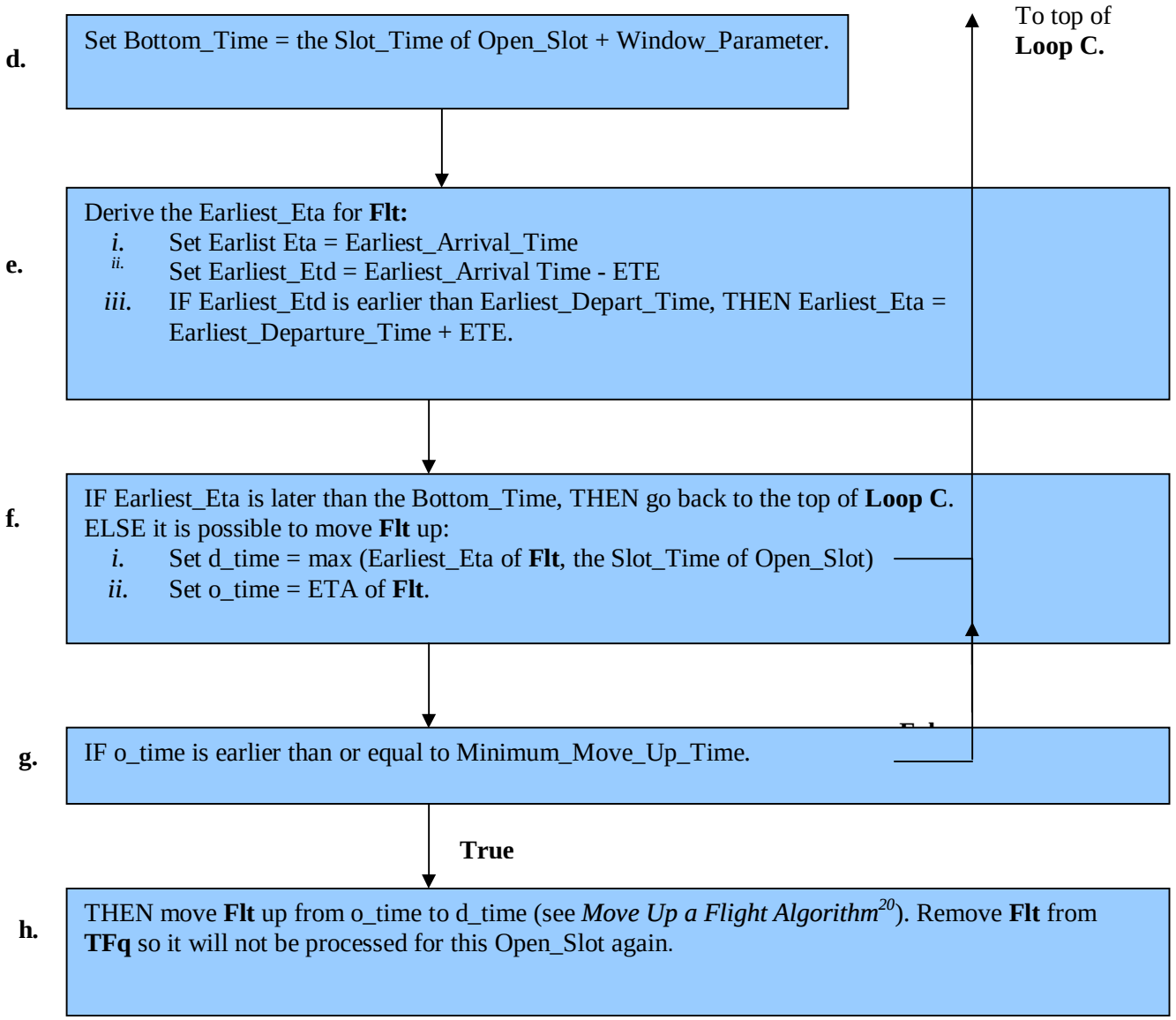

End Loop C

End Compress Flight Algorithm

[21] See "Move Up a Flight Algorithm (page 365)

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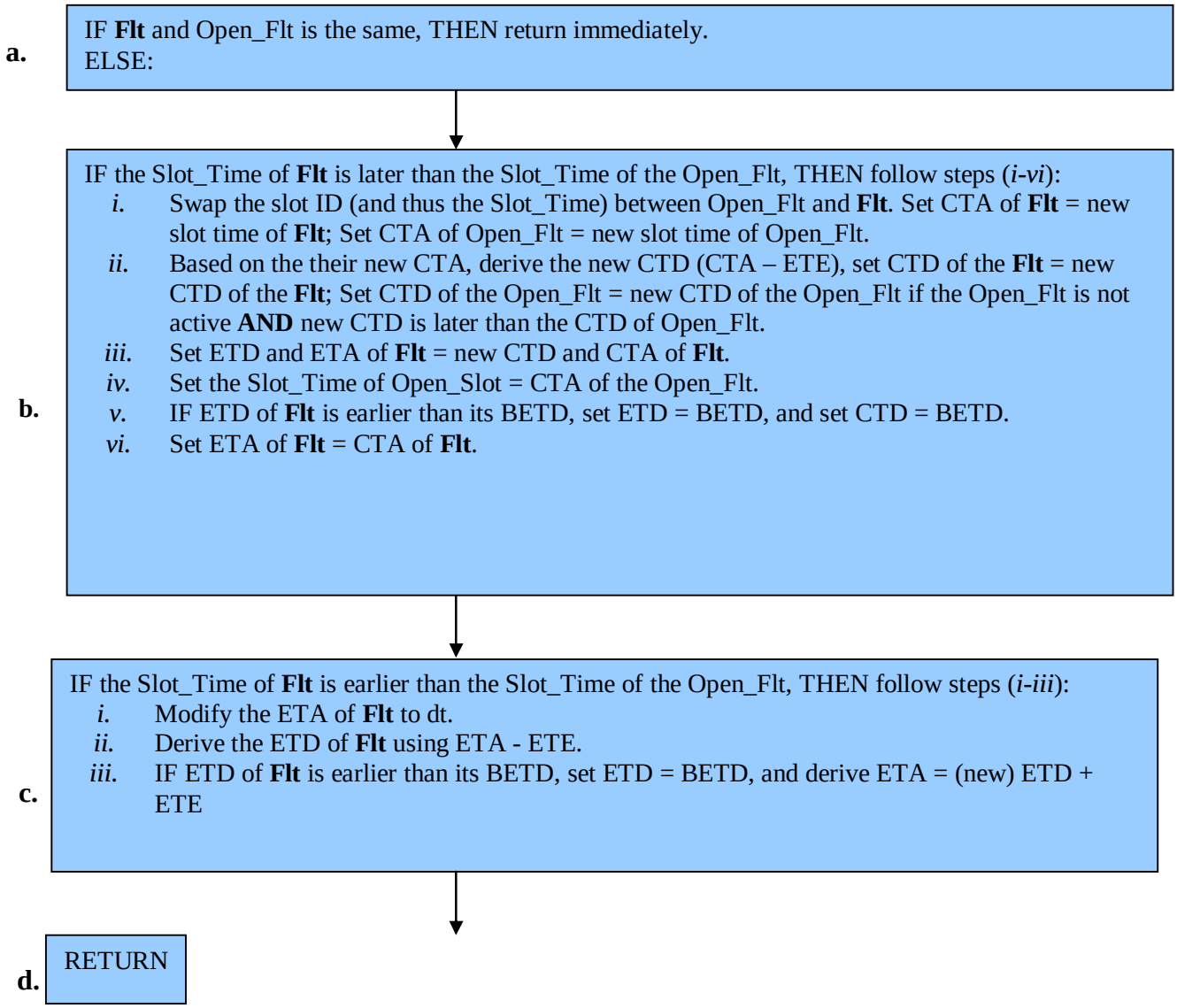
C.3.4 Move Up a Flight Algorithm

This function requires the following input parameters:

a. A flight record (Flt), which is to be swapped with an open slot.
b. Open_Slot.
c. A flight record (Open_Flt), which is associated with Open_Slot.
d. The time from where the flt is moving (ot).
e. The time to where the flt is moving (dt).



End Move Up a Flight Algorithm

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C.4 "+/- Delay" Algorithm

Note that the "program" in the following text refers to "+/- Delay" program. This function requires the following input parameters:

a. Start time = t0
b. End time = t1
c. Data_Time
d. Included AFIX
e. Included Aircraft Type
f. Included Major Carrier
g. Adjusted minutes (A_Min)
h. Plus_Time in minutes indicate how many minutes within the data time should be used for departure exemption
i. Specific flight exemption
j. Specific airports exemption
k. Facilities (centers/airports) involved

Step 1

Find all arrival flights included in the program. A flight is included IF all three criteria (*i-iii*) below are true:

i. Its AFIX, Aircraft Type, and Major Carrier fit specified criteria.
ii. It has a slot ID
iii. Its ETA is within the specified program time (from t0 through t1)

Step 2

Use the exemption criteria specified by the user to determine if an included flight is exempted from this program.

Set Wheel_Departure_Time = IGTD - taxi. IF the IGTD of the flight has no value, use the following fields in the listed order:

- SGTD + taxi
- LGTD + taxi
- PGTD + taxi
- BETD (ETMS ETD)

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Set Wheel_Arrival_Time = IGTA - taxi. IF the IGTA of the flight has no value, use the following fields in the listed order:

- SGTA – taxi
- LGTA – taxi
- PGTA – taxi
- BETA (ETMS ETA)

Each exemption criteria below (**a-e**) are checked against the flight

a Specific source airport (input item (j)).

b Departure time- IF CTD is valid, set t = CTD;
ELSE set t = Wheel_Departure_Time; the flight is exempted when t is less than (earlier than) Data_Time (input item (c)) + Plus_Time (input item (h)).

c Specific flight (input item (i)).

d Source facilities (input item (k)).

e Schedule Arrival – IF a flight is scheduled to arrive before the t0, but is delayed into the "+/-" time frame, this flight should be exempted to avoid double penalty. Wheel_Arrival_Time is used as the scheduled arrival time if the flight is not controlled;
ELSE, CTA is used.

Add the flight in the **Non_Exempt_q** if it is not exempted.

Step 3

Adjust delays to the flights in the **Non_Exempt_q**. Go through **Loop 1**.

Loop 1

Process each flight in the **Non-Exempt_q**.

a. Get a flight from the **Non_Exempt_q**.

From **Loop 1(f)**

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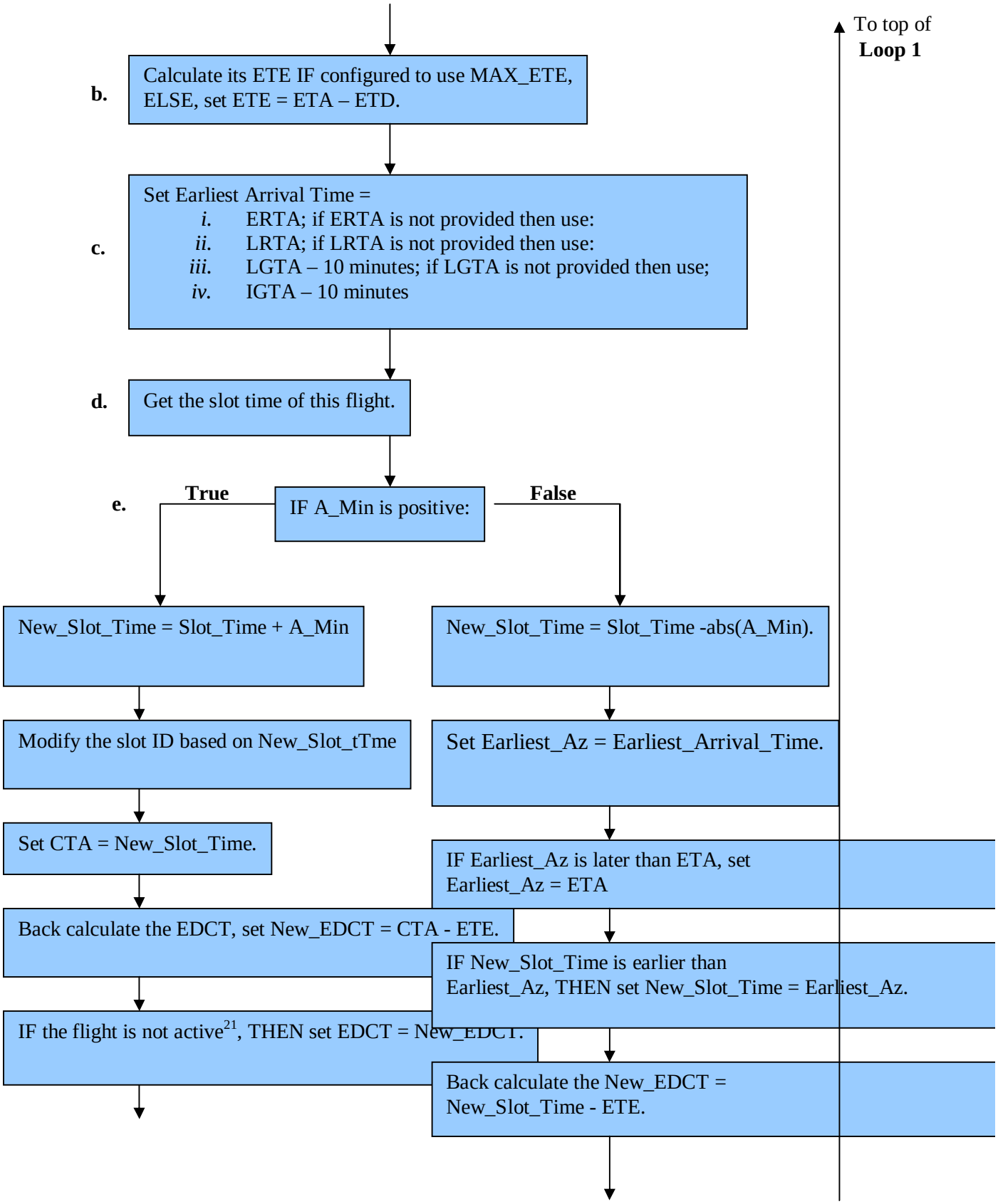

[22] A flight is active if its ETD has a prefix letter of "A" or "E".

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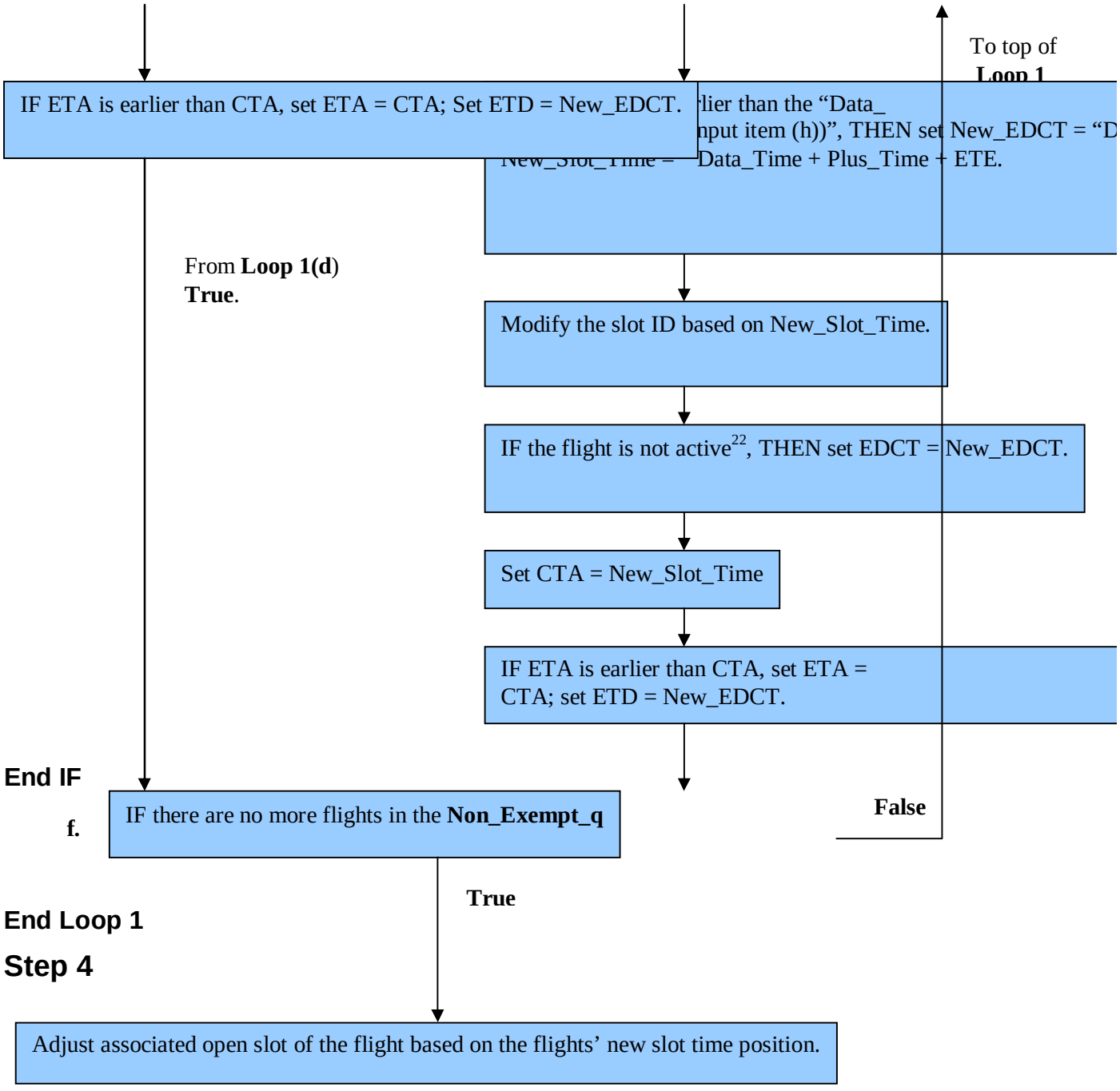

End "+/- Delay" Algorithm

[23] A flight is active if its ETD has a prefix letter "A" or "E".

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C.5 Ground Stop Algorithm

Note: The "program in the following text refers only to "Ground Stop" program.

This function requires the following input parameters:

a. One or more Ground Stop Statements, each contains the following parameters:[23]
   1. Start time = t0
   2. End time = t1
   3. Involved facilities - centers and/or airports

b. Included AFIX
c. Included Aircraft Type
d. Included Major Carrier
e. Target AAR (for each 15 minute time period)
f. Plus_Time in minutes indicate how many minutes within the data time should be used for departure exemption
g. Specific flights exemption
h. Specific airports exemption
i. Data_Time
j. Option of Immediate/Future Ground Stop is intended.[24]

Step 1

Put all the input Ground Stop Statements into a statement-queue, sort the queue by t1 (End Time) of the Ground Stop Statement.

Step 2

Process each flight record in the system, Do **Loop 1**.

[24] The current panel selection is the first for Ground Stop parameters.
[25] The difference lies in the default setting of the above parameters.

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Loop 1

For each flight in the system

a. Determine if the flight is included. A flight is included if conditions (*i & ii)* below are both met.

i. It is not cancelled.

ii. Its AFIX, Aircraft type, and Major Carrier fit specified criteria.

b. IF the flight is included.

False

True

c. Set Wheel_Departure_Time = IGTD + taxi. If the IGTD of the flight has no value, use the following fields in the listed order:

- SGTD + taxi
- LGTD + taxi
- PGTD + taxi
- BETD (ETMS ETD)

d. Set Wheel_Arrival_Time = IGTA – taxi. If the IGTA of the flight has no value, use the following fields in the listed order:

- SGTA – taxi
- LGTA – taxi
- PGTA – taxi
- BETA (ETMS ETA)

Loop 2

For each Ground Stop
Statement in the statement-queue

a. Further check this flight against inclusion and exemption criteria specified in this particular ground stop statement.

b. The flight is excluded from this ground stop statement if its ETD is not within the specified time frame (between t0 and t1).

From **Loop 2(e).**

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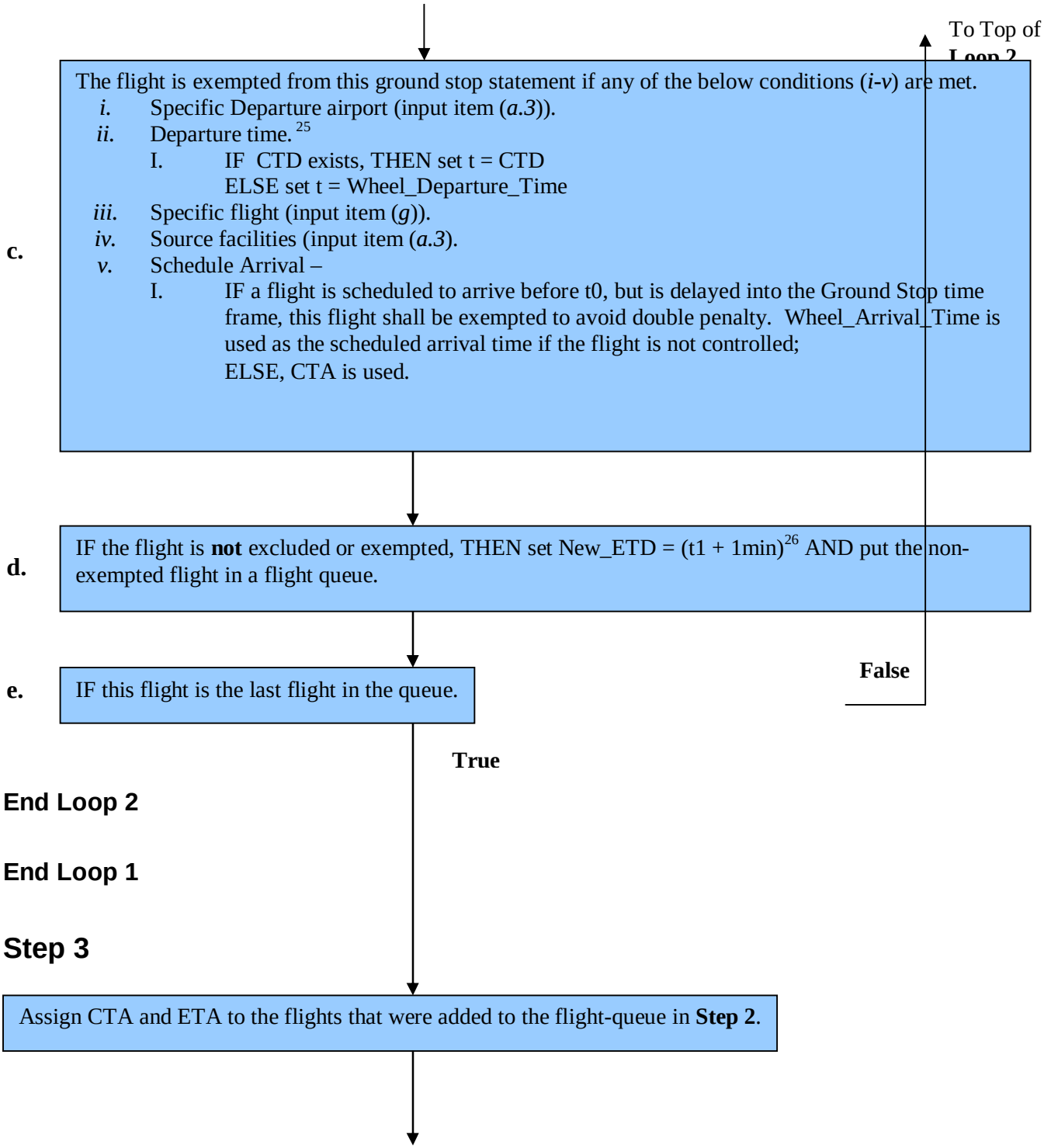

[26] The flight is exempted when t is less than (earlier than) Data Time (input item (*i*)) + Plus_Time (input item (*f*)).
[27] Because the Ground Stop statements are sorted by its t1 (Step 1), the flight will always get the latest new_ETD if more than one statement includes this flight.

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Loop 3

For each flight in the Flight_Queue.

a. Calculate its ETE IF configured to use MAX_ETE, ELSE set ETE = ETA-ETD.

b. Set CTA = ETA = New_ETD + ETE.

c. Set ETD = New_ETD.

d. If the flight was never controlled, Set EDCT = New_ETD. ELSE IF the flight is not active[27], Set EDCT = New_ETD

e. Modify the slot ID based on CTA.

f. IF this flight is the last flight in the queue.

False

True

End Loop 3

End of Ground Stop Algorithm

[28] A flight is active if its ETD has a prefix letter of 'A' or 'E'.

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C.6 Purge Algorithm

The Purge Algorithm is used by FSM to model the cancellation of a Traffic Management Initiative. The **ECDT** > *Purge* command is sent to ETMS for implementation. ETMS then uses the same logic for the Actual purge.

This function requires the following input parameters:

a. MIN_NOTIF_AFTER_EDCT_PURGE = 45 minutes.

> **Note:** The MIN_NOTIF of 45 minutes is configured in both FSM and ETMS to match each other. 45 minutes is the average minimum time an airline needs to get a flight ready for takeoff after a program is cancelled.

b. Use_Time
c. Actual_Depature_Time

Step 1

IF the flight is active or completed, THEN set ETD = Actual_Depature_Time and do NOT Purge. Otherwise, do Step 2.

Step 2

IF CTD is less than or equal to (now + minimum notification time), THEN do Step 2(a). ELSE do Step 3.

a.

- Do NOT change ETD/ETA
- Remove control times (CTD, CTA, CTL_ELEM, etc.)

Step 3

IF CTD is greater than or equal to (now + MIN_NOTIF_AFTER_EDCT_PURGE THEN do Step 3(a & b).

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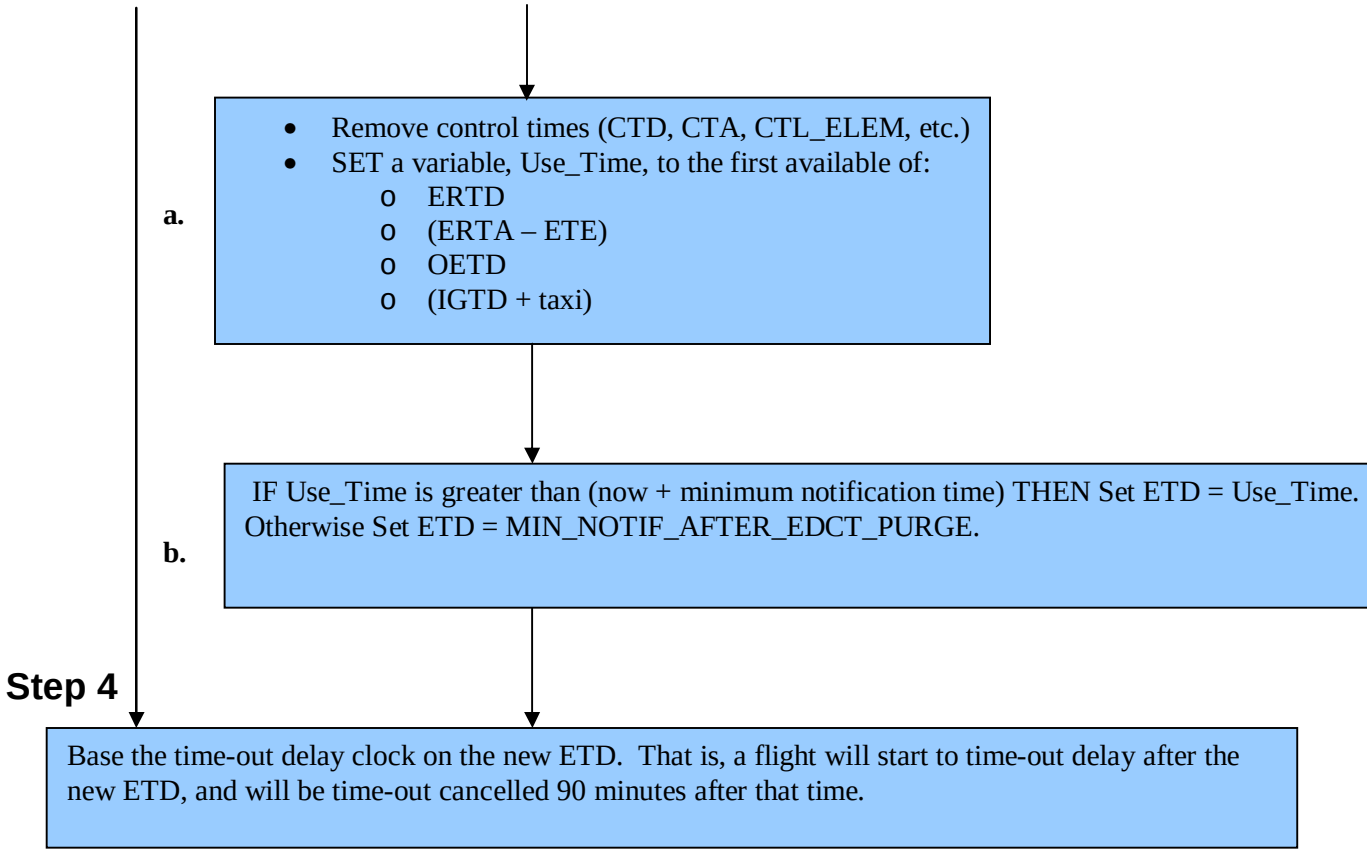

Note: Flights that only have OAG data will have already been time-out cancelled, as those are based on the SGTD, not the ETD.

End of Purge Algorithm

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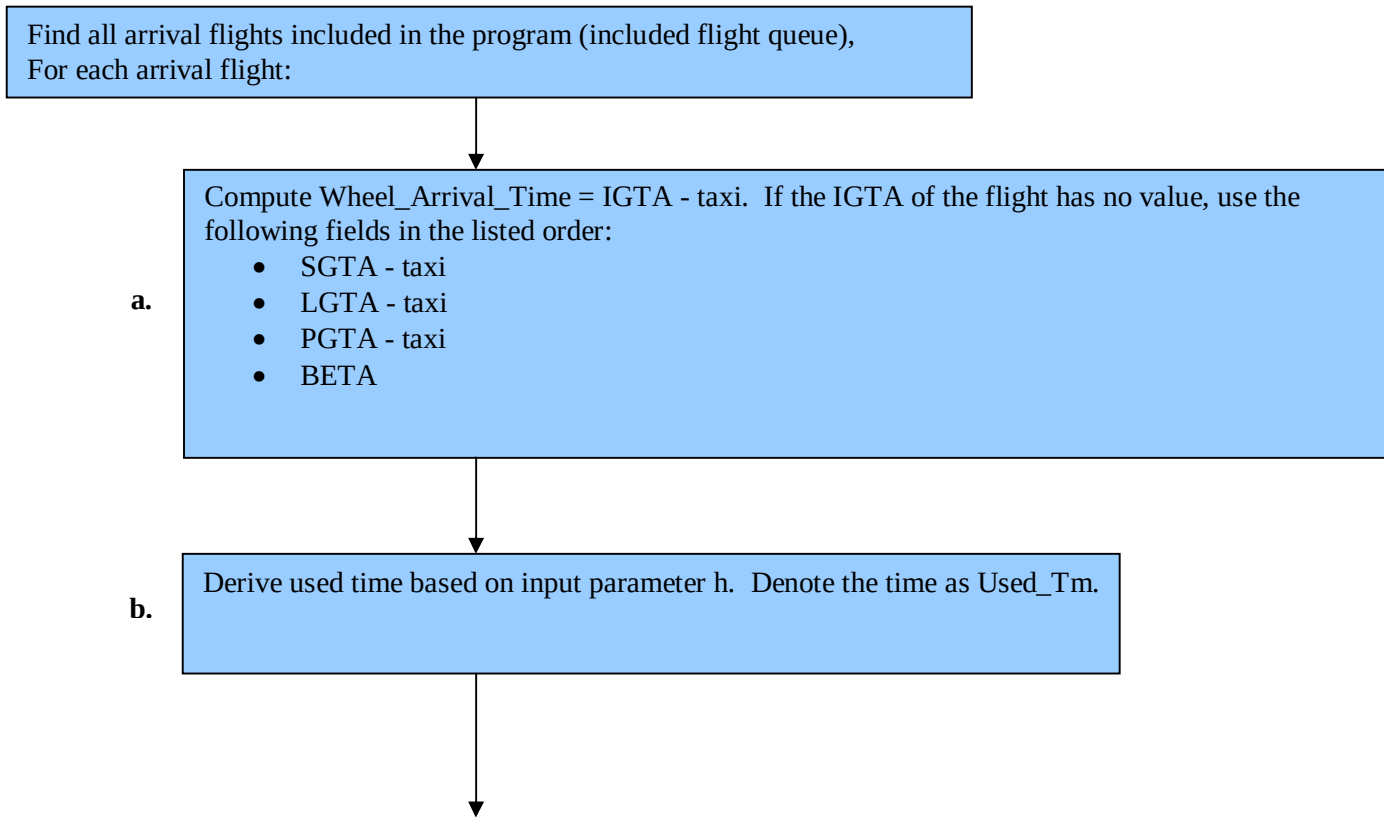
C.7 Airborne Holding Algorithm

This function requires the following input parameters:

a. Airport. The Airport object that the algorithm will be applied to.
b. Data Time = dt.
c. Start Time = t0.
d. End Time = t1.
e. AAR Values (for each 15 minutes time period).
f. GA_Factor (per hour or for each 15 minutes time period).
g. Taxi (Default 10 minutes).
h. Time field to be used. (BY_ETA, BY_BETA, BY_WHEEL_AZ, BY_OCTA, BY_CTA, BY_EAFT)

Note: All Operations outlines below are performed on flights of the target airport.

Step 1



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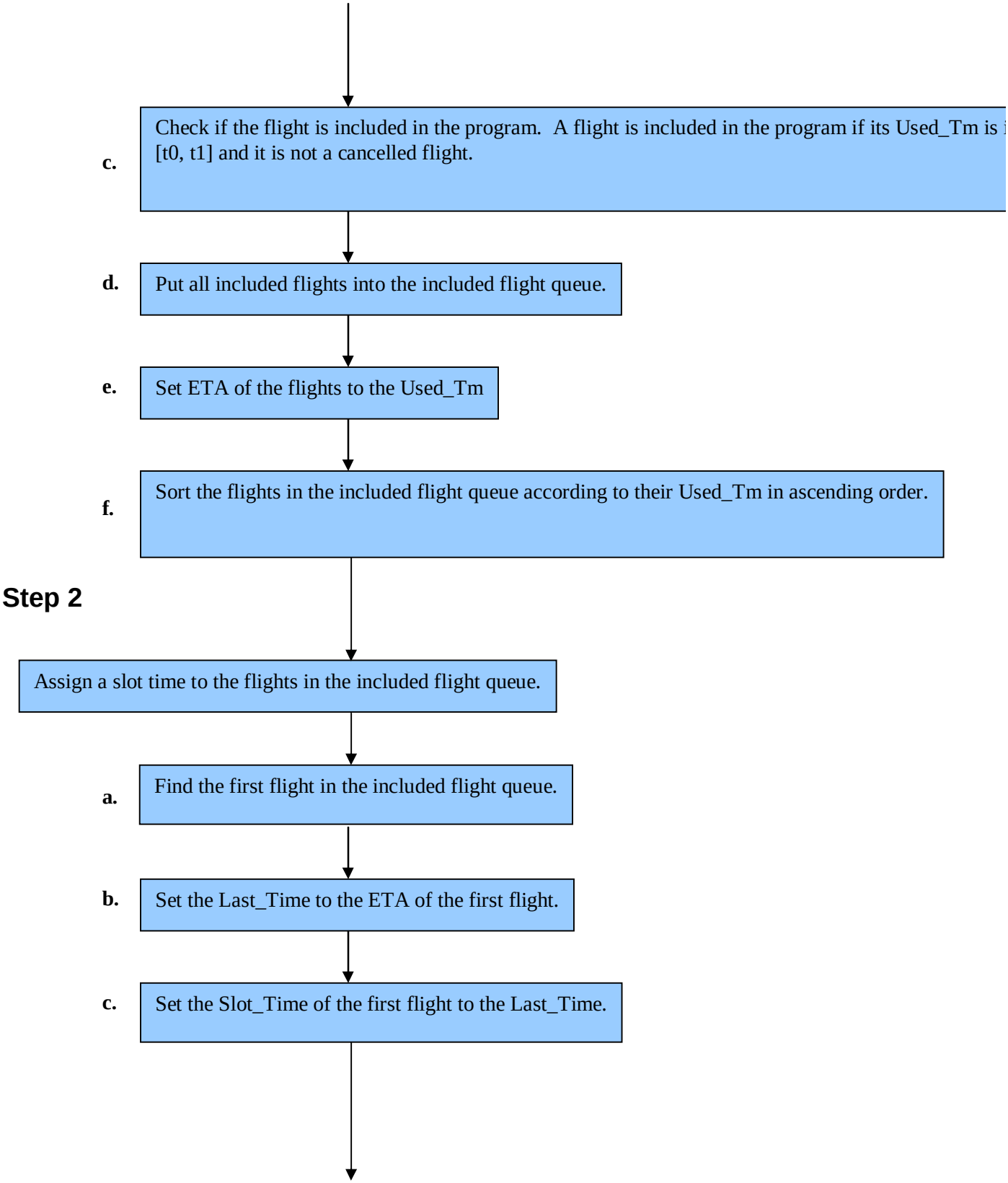

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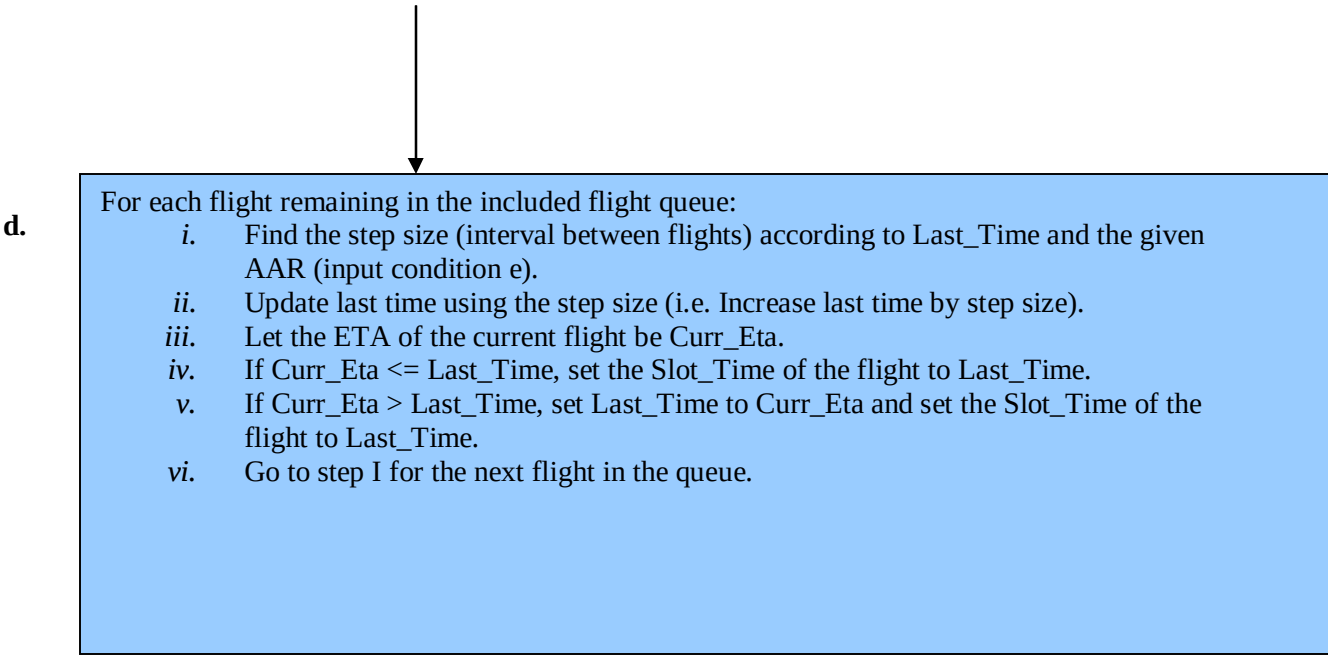

End Airborne Holding Algorithm

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Appendix C: Glossary of Abbreviations

III - Category III Flight (flight remark)

AAL - American Airlines

AAR - Airport Acceptance Rate

ADC - Advise Customs (flight remark)

Airborne Holding - A deterministic mathematical model used to calculate predicted airborne holding.

AffAvgDelay - (Affective Average Delay) total delay divided by number of non-exempted flights, calculated after running a GDP

ALD - The carrier imposed a delay on the flight (delay status).

ARTD /ARTA - Actual Runway Times (Departure/Arrival)

ASD - Aircraft Situation Display

ATA - Actual wheels-on Arrival Time

ATCSCC - Air Traffic Command System Control Center

ATD - Actual wheels-off Departure Time

ATR-310 - Traffic Flow Management Integrated Product team

ATL – Atlanta International Airport

ATV - Altitude Reservation (flight remark)

AUA-500 - Air Traffic Systems Development, Traffic/Flight Service Station

BETD/BETA - Beginning Estimated Wheel Times

BOS - General Edward L Logan International Airport in Boston

CC – Alarm Status for flights arriving more than 5 minutes before or more than 5 minutes after their Control Time of Arrival

CDM - Collaborative Decision Making

CF – Alarm status for flights that were cancelled but later flew without the flight being reinstating properly.

CNX – Cancelled Flight; Cancel

COA - Continental Airlines

CTA - Revised OrigCTA (Controlled Time of Arrival) after substitution/cancellation

CTD – Controlled Time of Departure

CTT - Collaborative Technology Testbed

DCenter - Departure Center

DEP - Departure Airport

DP - Departure Procedure

DTRSN - Departure Procedure Transition

DV - The flight was cancelled and diverted to an alternate destination (cancel status).

DVT - Diversion Recovery flight (flight remark)

EA - The actual flight time is greater than a specified value, but the flight status is not "cancelled." The default value is 15 minutes (alarm status).

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EC - The departure boundaries are more than 5 minutes before or more than 5 minutes after their estimated departure clearance time (alarm status).
ECR – EDCT Request Tool.
EGF - American Eagle Airlines
EPS - Airport Engineering Performance Standards
ERTD/ERTA - Earliest Runway Times
ETA - Updated Estimated (wheels-on) Arrival Time. Prefixes: P (proposed), E (estimated)
ETD - Updated Estimated (wheels off) Departure time. Prefixes P (proposed), E (estimated)
ETE - Estimate Time En Route in minutes
ETMS - Enhanced Traffic Management System
FAD - Fuel Advisory Delay
FADT List - Generated after running a GDP. Contains information about all ground-delayed flights (all flights that have been issued an OrigEDCT). If a center or an airline has ground-delayed flights, their call-signs, departure airports, PTimes, EDCTs and CTAs are given for each appropriate center and airline
FCA - Flow Constrained Area (flight remark)
FSM - Flight Schedule Monitor
FX - A CDM message used by the airlines to indicate a canceled flight (cancel status).
GCD - The Great Circle Distance (GCD), which is the distance between the departure airport and arrival airport
GDP - Ground Delay Program
GDT - Ground Delay Tools
GS- Ground Stop
HITL - Human in the Loop
IGTD/IGTA - Initial Estimated Gate Times
LFG - Lifeguard Flight (flight remark)
LGTD/LRTD/LRTA/LGTA - Airline Gate and Runway Times
LTOD - Length of Time Out Delay.
MOA - Memorandum of Agreement/ Military Operations Area
NRP - National Route Program Flight (flight remark)
OAG - Official Airline Guide
OCTD/OCTA - Original Control Times
OETD/ OETA - Original Estimated Wheel Times
ORD - O'Hare International Airport in Chicago
OOOI – OUT/OFF/ON/IN - Time that the flight was out of the departure gate, off the departure runway, on the arrival runway, and in the arrival gate.
PGTD/PGTA - Proposed Gate Times (Departure/Arrival)
Power Run - A Tab in the GDT *Setup* component, which allows you to model various scenarios to help evaluate what parameters are most favorable.
RBS - Ration By Schedule. A ground delay algorithm based on the OAG time.

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RBS++ - An enhanced version of RBS which automatically performs compression.
RM - The flight has been removed from the ETMS database (cancel status).
RS - An internal ETMS message generated when a specialist takes an OAG flight out of the database (cancel status).
RZ - A NAS flight plan cancellation message (cancel status).
SGTD/SGTA - Scheduled Gate Times (Departure/Arrival)
SCDT List - Contains flight delay information for the airport that has been issued a ground delay. Information such as flight's call-sign, equipment type, departure airport, Ptime, etc.
Schedule Accuracy - The sum of the absolute values of the difference of (actual departure time - estimated departure time) for each flight, divided by the number of valid flights.
SCS - Slot Credit Substitution
SF - Spurious Flights or flights submitted as SI cancellations with no corresponding entries in the OAD (alarm status).
SFO - San Francisco International Airport
Slot List - A modified FADT List. In addition to the information provided by the FADT list, the slot list also includes the slot ID, flight class and information about exempted flights.
Slot ID - A time slot assigned during ground delay, substitution/cancellation
STAR - Standard Terminal Arrival Route
STRSN - Standard Terminal Arrival Route Transition
SWP - SWAP flight (flight remark)
TO - The flight time out considered canceled because no activation message has been received within a certain time of the predicted departure time (cancel status).
TOD - Time Out Delay -the flight passed its ETD without taking off (delay status).
UX – Cancelled flight due to an EDCT update by a traffic manager (cancel status).
WXR - Severe Weather Route (flight remark)

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